PULP & PAPER

JULY 1, 1956 – 30th Year

Second Fastest Growing Industry
page 6

New Report on Bowater Log Pond
page 52

ANNUAL PULPWOOD REVIEW
includes American Pulpwood Assn. annual papers and reports, pro and con of Timber Resource Review
page 60

1910	1920	U. S. PULPWOOD CONSUMPTION (in cords)	1945	1955
4,000,000	6,100,000		16,900,000	33,300,000

Cry "Timber!" in Arkansas — Picture by PULP & PAPER

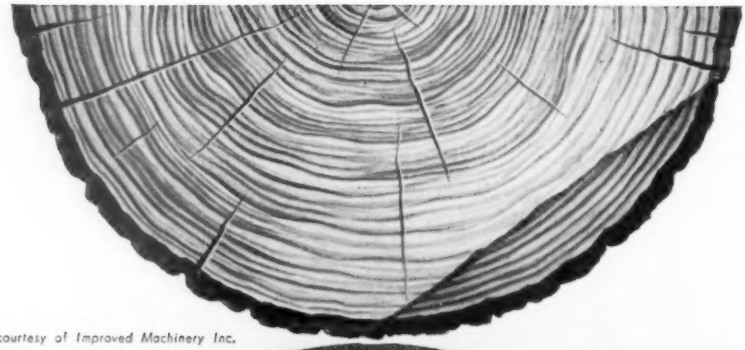
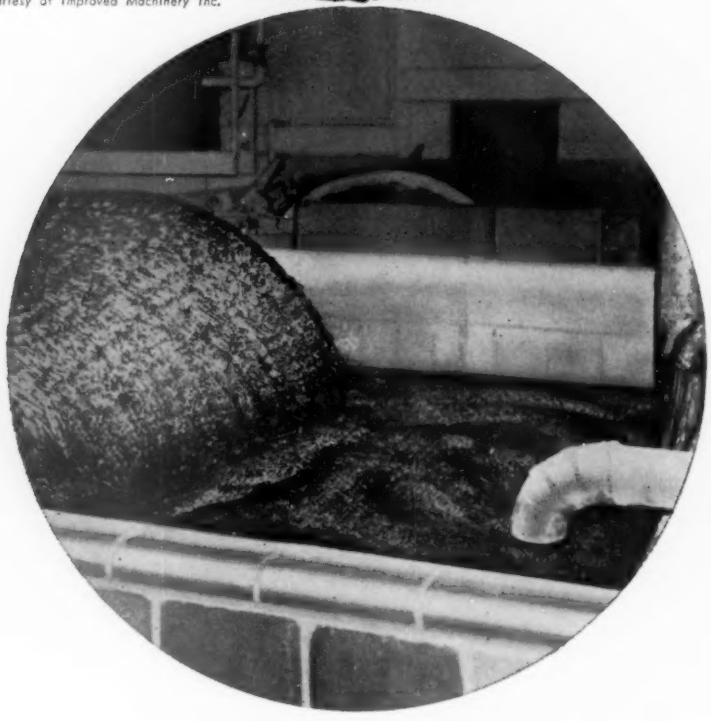


Photo courtesy of Improved Machinery Inc.



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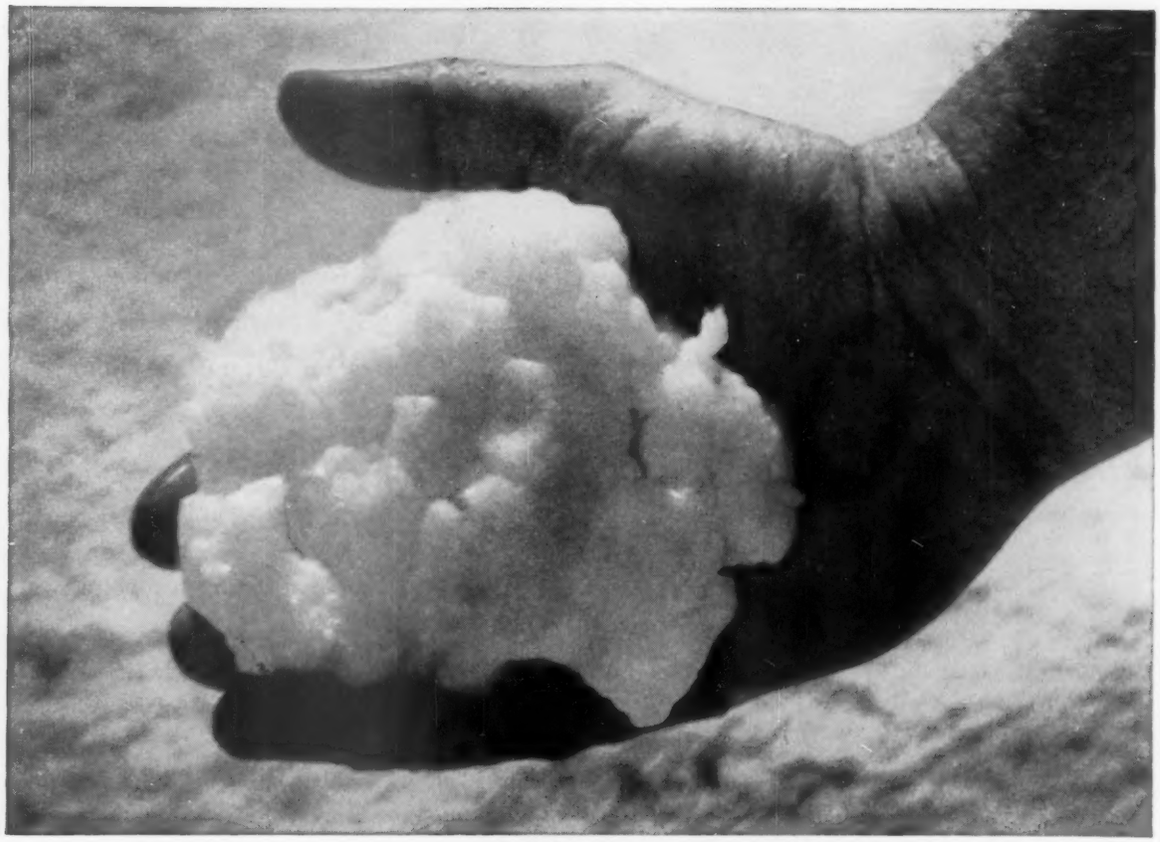

Photograph of Western Hemlock pulp bleached snowwhite at world's largest specialty paper mill—The Camas Division, Crown-Zellerbach Corporation.

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PULP & PAPER

EDITOR READS HIS MAIL

For Winning Public Interest Award

Detroit, Mich.

Editor: Congratulations to you and to your magazine for earning the National Safety Council's Public Interest Award for your contributions to public safety.

I'm sure you feel as we do that any way that we can serve in making the American people more clearly aware of some of the cardinal rules of safety and helping to call attention to the importance of being safety conscious is truly in the public interest.

We at Dodge are convinced that the National Safety Council is performing a real service in acknowledging your efforts, and those of others, with its Public Interest Awards. Through the awards themselves, the Council is encouraging more contributions such as yours.

I'm sure it is a real satisfaction to you to receive the Award. Congratulations again, and best wishes.

W. C. NEWBERG
President,
Dodge Division,
Chrysler Corp.

From Alaska's Governor

Juneau, Alaska.

Editor: The article on the pulp and paper industry in Alaska was very fine and I am pleased with it.

These articles are very helpful in the development work we are attempting to do up here. We hope it won't be too long before new plants call for another big story on Alaska.

B. FRANK HEINTZLEMAN
Governor of Alaska

From Chemist in South Spain

Algeciras, Spain.

Editor: I am a Spanish chemist and I have worked since 1951 in the Celupal, S.A., Pulp Mill in Algeciras, Spain. I am also a subscriber to your PULP & PAPER, which I read every month with great interest. I have to confess that I am eager for it!

I would like to express my enthusiasm for your magazine which I am sure is the most valuable guide on pulp and paper for everyone dealing with our industry or working in it. Your news from all parts of the world is most interesting and very helpful for technical men the whole world over.

SANTIAGO GRATACÓS TURULL

An Outstanding Forest Code

Savannah, Ga.

Editor: In a recent issue of PULP & PAPER, I read that Mr. Paul M. Dunn, technical director of forestry for St. Regis Paper Co., "discussed Oregon's Forest Code, now recognized as an outstanding one." I shall appreciate it very much if you will advise me where I can obtain a copy of the statute in question.

HUGH C. JENKINS, Secretary,
Gair Woodlands Corp.

Mr. Jenkins, and others interested: The Oregon Forest Code, praised by Mr. Dunn, may be obtained by writing Lynn F. Cronemiller, Assistant State Forester, Oregon State Board of Forestry, Salem, Ore.

Liked Our Reports

New York City.

Editor: I can not set aside the April issue of PULP & PAPER without letting you know how well I think the news with respect to pulpwood and to this Association was handled. All who participated in the preparation of your pages 130 through 142 did a masterly job.

W. S. BROMLEY,
Executive Secretary,
American Pulpwood Assn.

Congratulations on Coating Story

Kalamazoo, Mich.

Editor: Congratulations on Pulp & Paper's article "Will Most Future Paper be Coated?" (Aug. 1955) and its selection as prize story in the contest sponsored by Fraser Paper Ltd. It is indeed an honor to have won with such a distinguished panel of judges.

Sincerely,
O. W. CALLIGHAN
Manager, Paper Sales Dept.,
Minerals & Chemicals Corp.
of America

A "Clean Sweep" for Hammermill Story

Erie, Pa.

Editor: I want to congratulate you for the fine job you did in presenting our story on the Neutracel plant in your June issue.

R. P. PRICE,
Vice President,
Hammermill Paper Co.

Erie, Pa.

Editor: Everyone I have talked to, who has read it, has liked it very much, and you are to be complimented on a job well done.

FREDERIC E. BAHRENBURG,
General Supt.,
Hammermill Paper Co.

Erie, Pa.

Editor: Your Neutracel Story is certainly a complete job and I am sure will be of much interest to readers of PULP & PAPER. I am impressed with the good printing of the cuts, including the front cover picture. You can well be proud of your work in preparing the Neutracel Story for PULP & PAPER.

GEORGE P. SAXER,
Media Supervisor,
Adv. Dept.,
Hammermill Paper Co.

Erie, Pa.

Editor: I had been looking forward to seeing this issue and was not one bit disappointed in your high grade effort. Your handling of the whole assignment was excellent.

JAMES R. PAYNE,
Research and Development,
Hammermill Paper Co.

So. Sudbury, Mass.

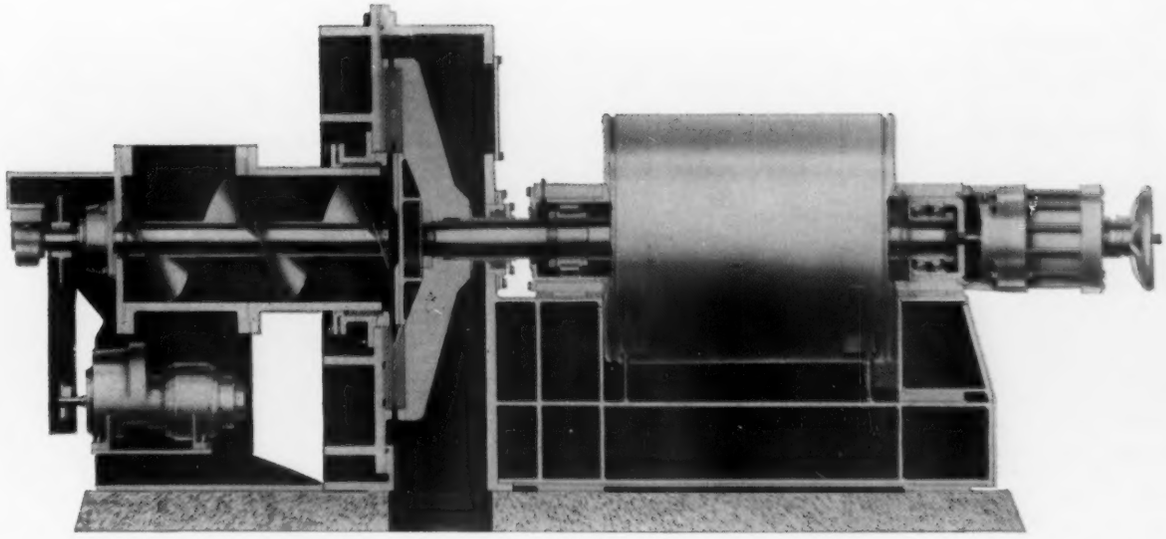
Editor: I was very pleased to receive the May issue of PULP & PAPER, and the interesting story about the Hammermill Neutracel Process, especially the way you showed how engineering models contribute to construction and design.

ROGER MERRILL, JR.,
Treasurer,
Atkins & Merrill, Inc.

HERE'S HOW to address your letter to this department:

No anonymous letters will be considered but names may be withheld if desired.

The Editor
PULP & PAPER
1791 Howard Street
Chicago 26, Illinois



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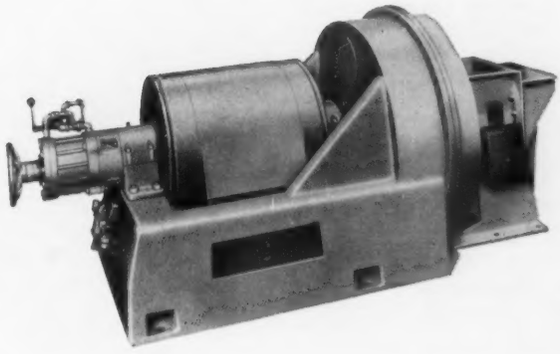


Now No. 2 Industry In Growing Pace

● Just about a year ago, Nation's Business completed a survey ranking pulp and paper as the third fastest growing industry in the nation. This month, Printer's Ink published a McGraw-Hill survey report which now rates pulp and paper as No. 2 in the country's growth industries.

According to the new figures, nonferrous metals leads the nation's manufacturing industries with the largest planning increases this year—123%. Pulp and paper is next with 83%, and steel and automobile industries follow up with 82% and 81% respectively.

Interesting to note is that the national average for manufacturing is up 45% with plans for 1957 already equalling 1956 and approaching 1956 figures for three or four years hence. With no sign of a let-up, expansions in the pulp and paper field seem certain to hang on to this lead.

BOWATERS MILL DEFINITE . . . Bowaters in London has announced that it definitely will build a new pulp mill at Rock Hill, S. C., on the Catawba River—a location termed "probable" until now. Decision was reached in London at a meeting of the board of directors attended by K. O. Elderkin, vice president and general manager Bowater Southern subsidiary, operator of the big $60,000,000 newsprint mill at Calhoun, Tenn.

No word yet on the cost of the new installation or exactly what will be produced there. There is reason to speculate, however, that in addition to pulp, newsprint may also be manufactured at the South Carolina mill.

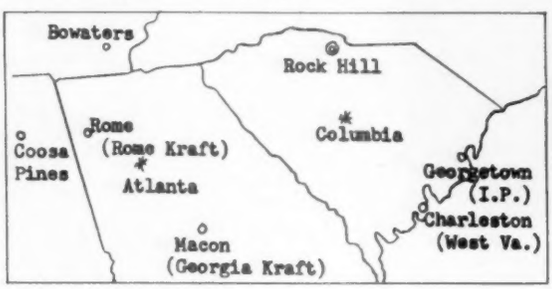
The company meanwhile is going ahead with other big plans: Number 4 machine at Bowaters Southern, Calhoun, may boost production from present 300,000 tons to 400,000; the company also is moving ahead with plans to build a new groundwood mill somewhere in Canada which will probably produce about 100,000 tons.

SCOTT TO ADD BARKING AND PULPING FACILITIES AT EVERETT . . . Scott Paper Co., Everett, Wash., now able to make over 700 tons a day of bleached sulfite pulp, split between ammonia base and calcium base processes, will increase its pulp capacity. This is "a future program"—no details were given—but before this happens, a new drum log barker and other facilities will be installed in a $1,000,000 program. The mechanical type barker will supplement the big Worthington hydraulic ring-type barker—widely known in the industry as a pioneer of bark removal by high pressure water jets—which is now operating at peak capacity.

Executive Vice President Raymond C. Mateer, who was out west from Chester, Pa., said the barker will be used to remove bark from the increasing volume of small-diameter logs made available through thinning, pre-logging and salvage logging. In addition, the company will install a new bridge crane for unloading logs from freight cars; cut-off saws; new chip silos; and various auxiliary equipment. A new building will be erected to house the woodroom addition. Existing hydraulic barking facilities are currently operating at capacity.

Mr. Mateer also mentioned plans for new pulp fiber recovery and refining equipment, reducing the amount of usable pulp presently going into effluent.

BIG PLANS AT GAYLORD DESCRIBED BY J. D. ZELLERBACH . . . Crown Zellerbach Corp.'s expansion of kraft paper and board capacity at its Gaylord Container Division in Bogalusa, La., will be completed by the end of 1957 and includes a new multi-wall bag plant. All together, Crown Z has spent $225,000,000 for mill and plant improvements in the past ten years.



Bowaters Will Build Mill Here

Rock Hill, S. C., is site for newly-announced Bowaters Southern paper mill. Locations of other major mills in area are shown. Rock Hill is about 190 miles from Calhoun, Tenn., site of Bowaters' news mill.

IN THE PARLANCE OF THE INVESTMENT WORLD, "Growth Industry" is a term used to differentiate certain industries from those which, by their very nature, are necessarily static, others that are speculative, etc. It has only been in recent years that most of the investment world has recognized pulp and paper as a genuine "Growth Industry." Its planning is longterm, its markets and uses are basic, they keep increasing, and it is the only major industry based upon a renewable resource—trees. Depressions may come and go—they will never wipe out trees.

At the first regional meeting of Crown Zellerbach Corp. stockholders ever held in the Pacific northwest, in Seattle, Pres. J. D. Zellerbach made these statements in describing past, present and future expansion and new construction projects.

"If we had more capacity, we could increase our sales," he said.

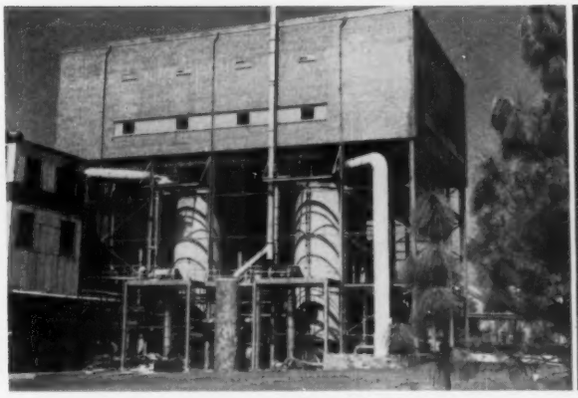
He said, in answer to a question from a stockholder, that CZ owns or has cutting rights on 25 billion bd. ft. of timber. Foreign sales now account for 10% of CZ products.

MORE PLANS FOR MILLS . . . Reports in industry circles told of a new Mississippi Pulp & Paper Co. planning a $30,000,000 mill at Columbus, Miss. Also reported as another likely mill site for a new operator in the South is Van Buren, Ark.

UNION BAG-CAMP MERGER . . . Directors of Union Bag & Paper Corp., presently scouting a location for a new paper mill, and Camp Manufacturing Co., Inc., one of Virginia's oldest and largest papermaking firms, have approved a merger.

The two corporations will either be merged or Union Bag will purchase the assets of Camp in exchange for stock in Union and assumption, by Union, of all Camp's liabilities. Final decision will be reached at a special meeting of Camp stockholders.

The new company will be called Union Bag-Camp Paper Corp. and Alexander Calder, now chairman of Union Bag, will be chairman of the board. James L. Camp, chairman of Camp, will be vice chairman of the new company and Alexander Calder, Jr., president of Union Bag, will be-



A KEY FACTOR IN UNION BAG-CAMP MERGER is this $3 million ClO_2 bleach plant. Because of heavy demand on its products Union has long resisted putting in a chlorine dioxide bleach plant although it has had it under consideration. Now, pressure may be lifted now that "super bright" products can be made at Camp.

CAMP MFG. CO. IS NO SLOUCH IN WOODLANDS. This company has been one of pioneers of integrated logging and sawmill waste utilization in the South. Here, a crane unloads pulpwood from a barge in the Blackwater River at Franklin. These are benefits which will accrue to Union Bag when merger with Camp is affected.

come president of the new organization.

Union Bag, which operates the largest paper mill in the world at Savannah, Ga. (six Fourdriniers) has been principally concerned with the production of unbleached kraft paper, paper bags, board and boxes. Camp has recently completed a chlorine dioxide bleach plant and produces about 380 tons a day of bleached and unbleached sulfate. The combination certainly means that Union Bag will now enter the bleached kraft paper field. Union Bag produces about 1,650 tons a day of sulfate and 300 tons of semi-chem a day and 1,800 tons of paper. Camp also produces about 350 tons a day of paper of various grades, including envelope and tablet paper.

Camp owns 240,000 acres of timber and timberlands in the Southeast. The company's sales for the first 12 weeks this year totaled $6,859,149, with net income at $987,577.

Union Bag's timberland holdings approximate 1,000,000 acres. The company operates converting plants in Chicago, St. Louis, Trenton, N. J., and Hudson Falls, N. Y. First quarter net income was $4,516,880 on sales of $34,415,152.

THREE NEW MILLS FOR COLOMBIA . . . The first three paper mills to produce newsprint and white paper, in Colombia, S.A., will be built by Parsons & Whittemore-Lyddon Organization at a cost of $30 million. They are expected to be in full operation by the summer of 1958.

Parsons & Whittemore specializes in international supply of pulp and paper and machinery for their production. It also constructs paper mills in foreign countries. One mill, which will be located near Bogota, will have a daily capacity of 100 tons of newsprint. Contract for its construction is with Empresa Nacionales de Publicaciones, which owns and operates the government printing and publishing plant.

The other two mills will be located at Cali, capital of the State of Valle de Cauca (50 tons daily of white printing and writing papers and 100 tons of bleached papermaking pulp). The three mills will use bagasse pulp and other materials—possibly wood.

Colombia hopes to become independent of newsprint imports as a result of the new mills. They have been importing about 22,000 tons a year.

NO SITE YET FOR TENNESSEE RIVER . . . Engineering surveys are still underway for four or five different locations for the new Tennessee River Pulp & Paper Co.'s proposed mill in northwestern Alabama. Machinery delivery dates are so far ahead that the firm isn't in any rush to start construction anyway. A manager for the mill is not expected to be named for several months.

ST. REGIS STILL "EXPANSION MINDED" . . . St. Regis, looking for 1957 sales to reach the $400 million mark and earnings to go up to $5 a share ($2.95 in 1955), will substantially increase production at Tacoma, Wash., and Bucksport, Me. Says Roy K. Ferguson, chairman and president: "We're still expansion minded." He said the company still prefers the "acquisition method used successfully with Rhinelander stockholders." St. Regis now has 15 container plants which will be either acquiring or constructing new units.

The 1956 sales estimates of the company take into account volumes from its 1955 acquisitions of Michigan Panelyte Molded Plastics, Pollack Paper Corp. and General Container Corp. and expected results from this year's acquisitions: Ajax Box Co., Gummed Products Co., Chester Packaging Corp. and Pacific Waxed Paper Co. Big lift will probably come next year when the Hinton, Alta., pulp mill and Jacksonville paper mill addition are completed. The "Jax" machine, announced as adding 1,000 tons a day to the present 300 tons capacity, may be able to even hit a fantastic 1,200 tons a day of board.

CONSTRUCTION READY FOR CAMAS MILL . . . Ground will be broken this summer for the new kraft bleach plant at the Crown Zellerbach paper mill in Camas, Wash. Present bleached pulp production varies from 175 to 400 tons a day, averaging about 275 tons. The new bleach plant will boost potential production another 300 tons to around 600. The $2.7 million installation will be in operation by late spring 1957.

WEYERHAEUSER PLANS ADDITION . . . Weyerhaeuser Timber Co. plans a 100-ton per day addition to its present bleached kraft board mill at Longview, Wash., according to E. N. Wennberg, Pulp Div. branch manager. Work started Feb. 1 and will be completed before end of the year, increasing the production of bleached board to 300 tons per day from No. 3 machine. The program calls for additional dryers on the 216-in. Beloit machine, installing a 150-ton continuous Kamyr digester, an additional 350-ton C.E. recovery unit and installing another Bellingham type hydraulic log barker.

WATCH ANOTHER CAROLINA TOWN . . . Calhoun Falls, S. C.—don't confuse it with Calhoun, Tenn.,

NEWS OF THIS "GROWTH INDUSTRY"

where Bowaters has its mill—may become a paper mill town one fine day. It is being considered a likely site for one of the big national paper companies.

WAYCROSS, GA., STILL A POSSIBLE PAPER TOWN . . . Waycross, Ga., once considered as a possible site for Rayonier, Inc., expansion (before it decided to build its new second mill at Jesup, Ga.), may still be a paper town. PULP & PAPER has learned that another paper company is studying the site as a possible location and preliminary studies have been made. No decision as yet, but the idea appears hot.

DON'T TRUST RECENT GROWTH FIGURES . . . Association executives in-the-know in New York have warned PULP & PAPER that some of the recent tables and statistics, published or released to the industry, giving calculated expansion data for 1956, 1957, and 1958 are already "badly out of date." Data for 1955 is accurate enough and 1956 is fairly close. But the book will have to be rewritten for '57 and '58—on the basis of millions of tons of added production in newspaper, paper and market pulp, new mills and additions to older ones announced recently.

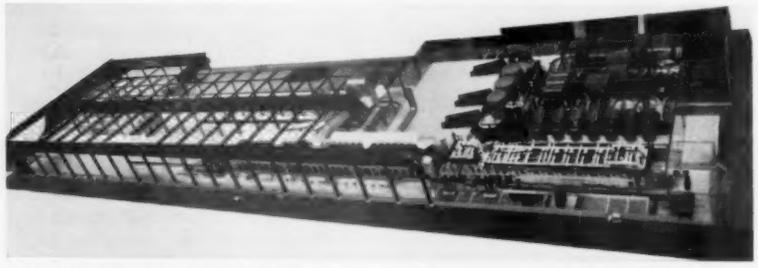
RECORD FIGURE . . . A building permit for $7,330,575 issued to Abitibi Power & Paper Co. at Fort William, Ont., for the company's expansion program at its adjacent Mission mill was the largest ever issued in the Lakehead city.

K-C EXPANDS IN BRITAIN . . . The Kimberly-Clark Corp. has announced a further expansion of foreign operations with purchase of a British paper concern by Kimberly-Clark, Ltd., of London. The acquisition is Reed Paper Hygiene, Ltd., converter of paper towels for industrial and domestic use. John R. Kimberly, president of the parent corporation, announced the purchase in Neenah on his return from England. He said it would make possible development of a broad range of barber shop products and creped wadding for industrial packaging.

STILL MORE EXPANSION BY MACMILLAN & BLOEDEL . . . MacMillan & Bloedel will spend an additional $1,250,000 at its Harmac bleached sulfate pulp mill near Nanaimo, Vancouver Island, to utilize cordwood for pulp manufacture, H. R. MacMillan, chairman of the executive committee, announces.

This new operation will be equipped to provide for fuller utilization of wood to be delivered by independent loggers, farmers and others who have pulp logs to sell within a 50-mile radius of the pulp mill.

It is understood that one of the reasons for this development is that the building of a pulp mill this year at Crofton on the east coast of Vancouver Island by B.C. Forest Products will deprive Harmac of one of its important sources of pulp chips, trucked from B.C. Forest Products' sawmill and veneer plant at Youbou on Cowichan Lake.



CONTAINER BREAKS GROUND. Construction started at Santa Clara, Calif., May 14 for a new Container Corp. of America boxboard mill and storage warehouse. The new mill will embody postwar developments in factory layout and processing equipment. The ultra-modern unit is shown above in ¾-in. scale model.

Scheduled to start operation July 1957, the new mill will have a top daily production of 150 tons of high grade folding boxboard and linerboard for Container plants on the West Coast, and also boxboard for independent paper box manufacturers.

Located on a 60-acre property, the new mill will have an operating area of 100,000 sq. ft. and warehouse area of 32,000 sq. ft. A special feature will be the driving of concrete piles under the paper machine and all stock preparation equipment, to assure proper alignment of all production units. It will include extensive use of instrumentation and automatic controls. Conveyors to service Dilts Hydrapulpers will be used. Machine drive will be of short center, V-belt type. Wet end will be driven both mechanically and by separate electric helper unit.

General manager of the mill will be W. H. RICHARDS, who joined Container in 1946, for past four years has been Mgr. of its Los Angeles paper mill. He previously was Paper Mill Supervisor at Philadelphia unit.

Announces Expansion Abroad

JOHN R. KIMBERLY, President and Chairman of Kimberly-Clark Corp., back from Europe, with announcement of plans for his company's expansion in Britain. A wide range of products will be made for foreign markets. Photo by PULP & PAPER.

POWELL RIVER DECISION TOUCHES OFF EDITORIALS . . . The warning last month by Chairman Harold S. Foley of the Powell River Co. that high costs in British Columbia are encouraging him to look to the Southern pine region for possible future expansion created quite a bit of editorial controversy in Vancouver, B. C., papers.

One thing pointed out by newspaper comments was that high forest and general taxes in British Columbia are adding to many natural disadvantages in competing with the South. Southern states, on the other hand, "are falling over one another with offers of tax and other concessions to lure mills." (British Columbia levies 5% sales tax on material and equipment for a mill; construction costs are about 24% lower in Atlanta, Ga., than they are in Vancouver; the U. S. government allows generous tax writeoffs not available in Canada. Result: The same mill can be built in the South for about 30% less than in Western Canada.)

NEW MILL FOR BOGALUSA, LA. . . . Textile Paper Products, now operating plants in Crossett, Ark., and Cedartown, Ga., will open a new factory in Bogalusa, La., under supervision of Robert Smith. Included among its products will be cores for paper rolls.

CELOTEX SLATES NEW MICHIGAN PLANT . . . Celotex Corp. will

build a new fibreboard mill at L'Anse, to be completed at a cost of $6,100,000 by 1958. It is the third recent new mill for Michigan using hardwoods. Also in the works for Celotex: A $3 million mineral fiber acoustical tile plant near Pittsburgh and a $6 million gypsum board plant and plaster mill near Ft. Dodge, Ia. In all, Celotex plans to spend $22 million for expansions, and nearly $7 million just for timber acquisition and plant site on the Upper Peninsula of Michigan. Another $6,000,000 is earmarked for the plant.

BIG PLANS FOR NEW HUSS PAPER MILL . . . Further plans have been outlined to PULP & PAPER by Alvin J. Huss for the newly formed Huss-Ontonagon Pulp & Paper Co., formed by Huss Lumber Co. of Chicago, recent purchasers of National Container's Ontonagon mill. The new company, Mr. Huss said, will embark immediately on a $3 million expansion program which will include the construction of additional plant capacity designed to use the neutral sulfite semi-chemical process in making pulp and container board from high-yield hardwoods available on Michigan's upper peninsula.

National Container's mill was the last of the Northern kraft fiber mills producing containerboard for corrugated box plants. It finally became uneconomical to continue because the stands of softwoods were depleted. The new mill will utilize a continuous digesting method—either Pandia or American Defibrator—and the Downingtown cylinder machine will be left in place and possibly utilized later for bleached semi-chem foodboard production. In addition, a 176 in. Pusey & Jones Fourdrinier machine with electronic sectional drive has been ordered. Expected to operate at 1,500 fpm, the machine will be housed in a new building.

LARGEST CORRUGATING MACHINE IN SOUTHWEST . . . Container Corp. of America will build a $1.5 million plant and expand operations at its Muskogee, Okla., plant. The company, which has been operating a 25,000 sq. ft. plant, expects to expand to about 100,000 sq. ft.—the new building to house the largest corrugating machine in the southwest. It should be running by early 1957.

WANTS U.S. SALES SYSTEM . . . Testifying before the Sloan Forestry Commission in Victoria, John Liersch, vice president in charge of timber and forestry of Powell River Co., advocated adoption in British Columbia of the U.S. timber sales system. He said that such a system would be particularly desirable in some of the province's under-cut areas. Instead of companies looking on their own initiative for timber stands, as is now done in British Columbia, the provincial forest service should decide what areas it was going to put on the market and then notify prospective buyers, said Mr. Liersch, whose experience has been in logging operations on both sides of the border and who headed the school of forestry at University of B.C. before the war.

Under the plan recommended by Mr. Liersch the government should do the same type of long-range planning as is now being done by private firms under forest management licenses.

Powell River Co., in a separate brief supplementing one previously presented to the Commission, stressed need for developing B.C. north coast forests, now being cut at only about 20% of the allowable, although some areas on Vancouver Island are being over-cut.

The company suggested that private enterprise should be encouraged to move operations to the north and thus relieve pressure on some areas in the southern part of the province.

In the Prince Rupert district "stagnant, overmature forests are preventing the establishment of dynamic young forests on which future generations must depend," the company spokesman declared.

This was significant in view of Powell River Co's interest in Kitimat as a possible newsprint mill site and Chairman H. S. Foley's statement at the recent annual meeting that the inferior quality of over-mature timber in the area would increase costs of operation.

Step Into Big Expansion "Streams"

Changes affecting these two widely known kraft men have spotted them with two big expanding companies in the South. DONALD C. PORTER (left), a 28-year employe of Kimberly-Clark, has moved to Coosa River Newsprint Co.'s Coosa Pines, Ala., mill, where pulp and newsprint expansion is underway, as new Mill Manager. President Art Wakeman announced the appointment. He had been Mill Manager at K-C's LongLac kraft pulp mill at Terrace, Onto., since that postwar mill started up. He will have important role now in doubling the size of Coosa River. GEORGE L. CLARKE (right), who had been Mill Mgr. at Coosa Pines, has joined International Paper Co., close on the heels of its announcement of a new $57,000,000 expansion at Pine Bluff, Ark., on top of its current extensive construction going on at Mobile. Mr. Clarke has had unusual intimate postwar experience in the building of kraft mills in North and South.

ANOTHER MERGER SCHEDULED . . . Federal Paper Board Co., Inc., will acquire the 40-year-old Morris Paper Mills at Morris, Ill., through an exchange of shares. Both companies manufacture paperboard and folding cartons and have combined annual sales of $60 million.

NCC-OWENS ILLINOIS MERGER . . . Samuel Kipnis, president of National Container Corp., says that informal discussions are being carried on with Owens Illinois Glass Co. as to possible integration of the two companies.

OBSTACLES TO MILL OVERCOME . . . One of the chief obstacles to an early start on a proposed $60,000,000 pulp and paper mill at Lepreau, New Brunswick by 1959, has been overcome as a result of a reported decision of New Brunswick Electric Power Commission to build an 80,000 hp thermal plant in that area. Co-sponsors of the project are Sir Robert McAlpine & Sons, London, and Butler Co., Chicago.

Reports from Montreal indicate that the proposed mill will have two newsprint machines with total capacity of 500 tons a day; also, facilities for a 200 ton chemical pulp output, 80 tons of which would be utilized in the newsprint operations.

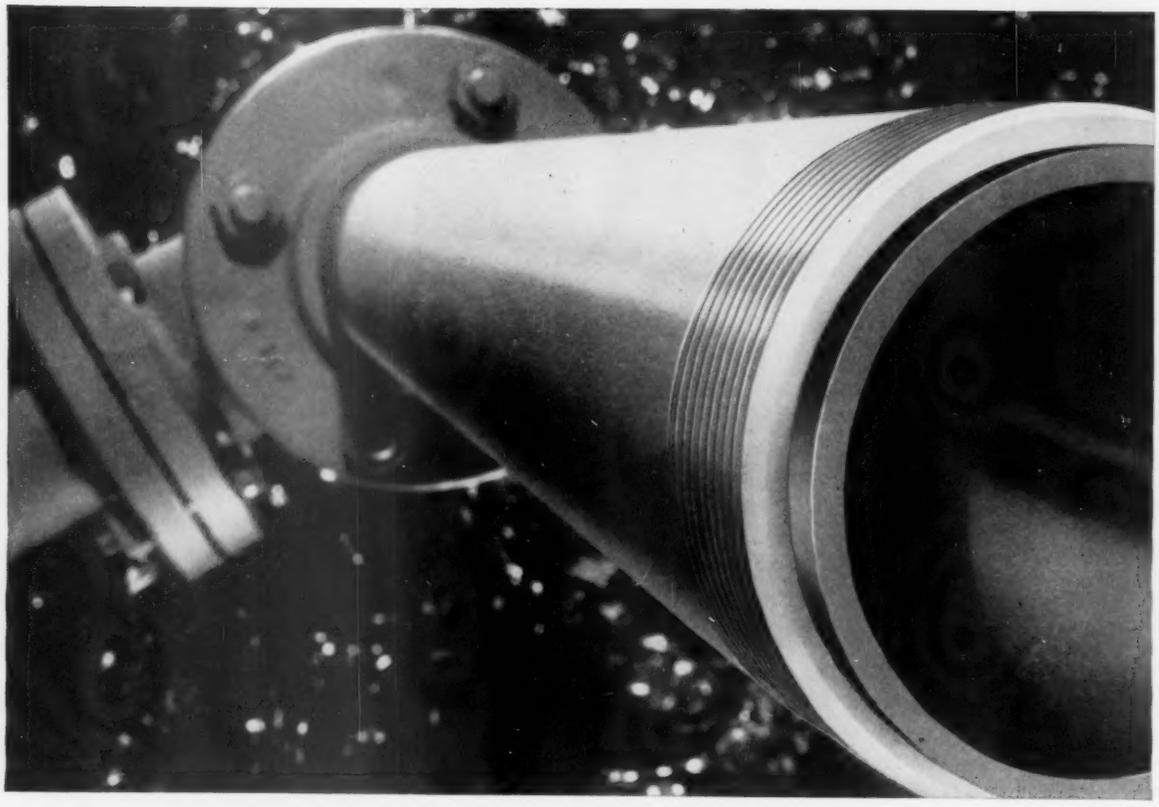
The mill will use an estimated 300,000 cords of hardwood and softwood annually, and sufficient wood to maintain the operation in perpetuity is said to have been assured.

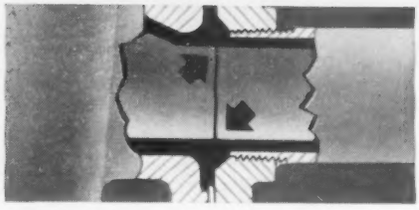
The equity capital will be from the United Kingdom and the United States, and it is understood that a $30,000,000 bond issue will be placed in the U.S., the financing to be private.

General contractors for the mill will be Sir Robert McAlpine & Sons, with Stadler, Hurter & Co., Montreal, consulting engineers.

FLINTKOTE ENTERS GYPSUM FIELD . . . The Flintkote Co. has announced plans to build a gypsum-processing plant at Sweetwater, Tex., to manufacture gypsum board, plaster and other gypsum materials. Major product will be gypsum board.

DOW





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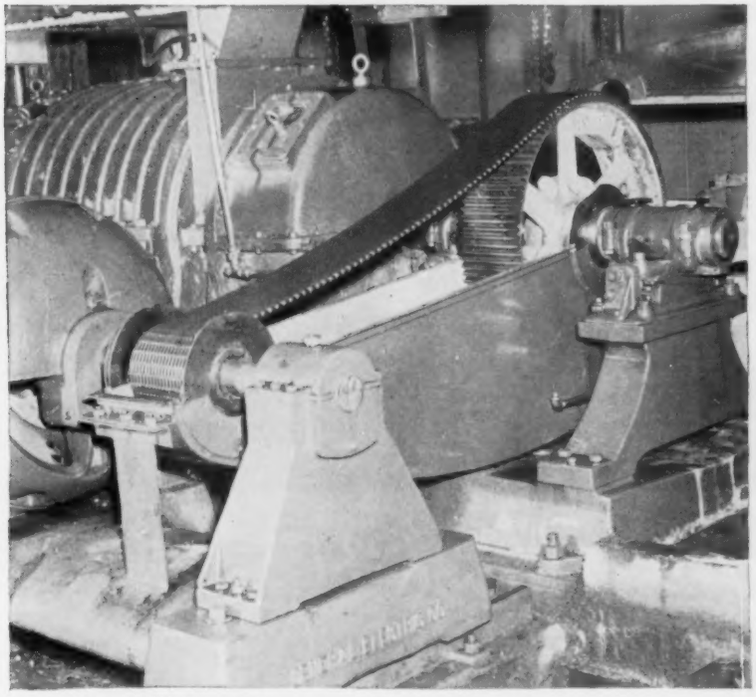
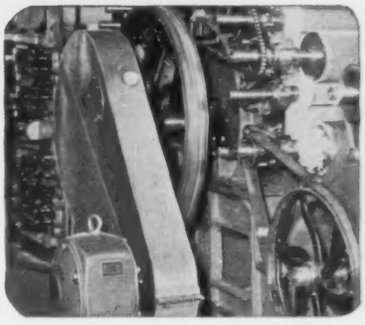
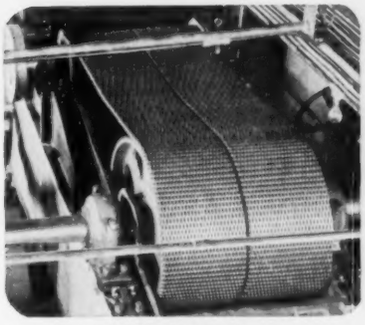


How do your drives compare?

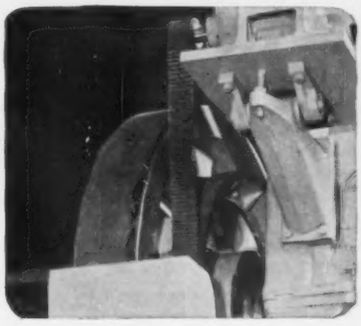


. . . IN SEVERE SERVICE. Link-Belt silent chain transmits power from a 100 hp motor to drive shaft of paper refiner. Link-Belt silent chain drives are often lower in first cost, always lower in ultimate cost—due to minimum maintenance requirements, long life and positive action which eliminates power losses due to slippage.

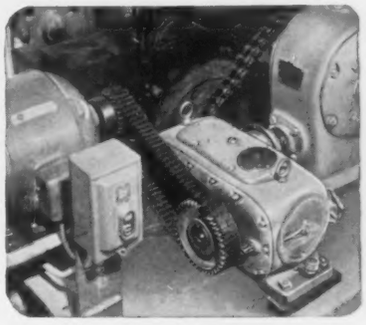
. . . UNDER ADVERSE OPERATING CONDITIONS. Humidity, heat, cold do not lower this chain's better than 98% efficiency.



. . . AT LARGE OR SMALL HP. A versatile line, these drives are available from fractional to thousands of hp.



. . . WITH LARGE RATIOS. Operates efficiently on extremely short centers at ratios as high as 10-to-1.



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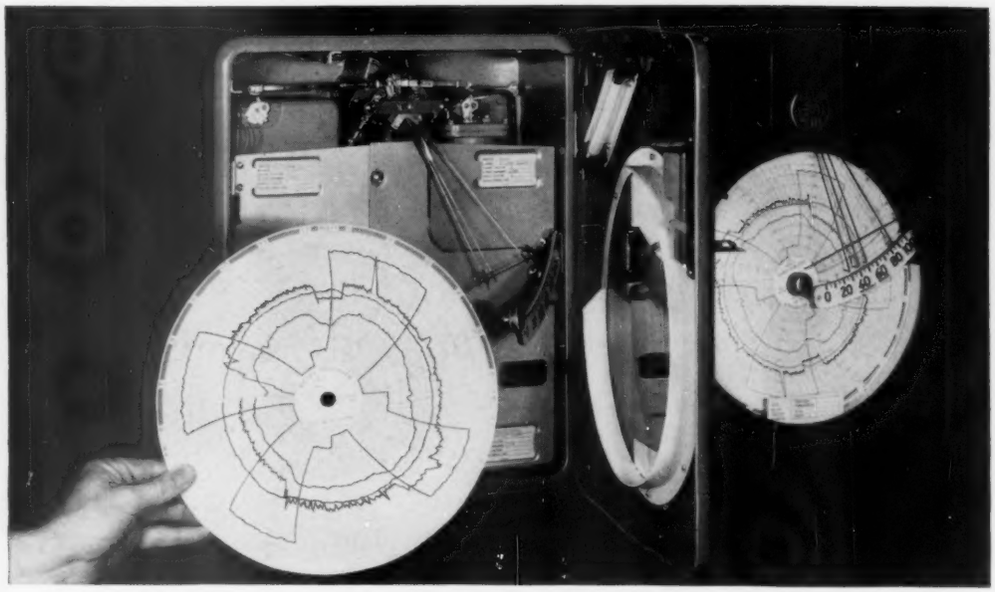

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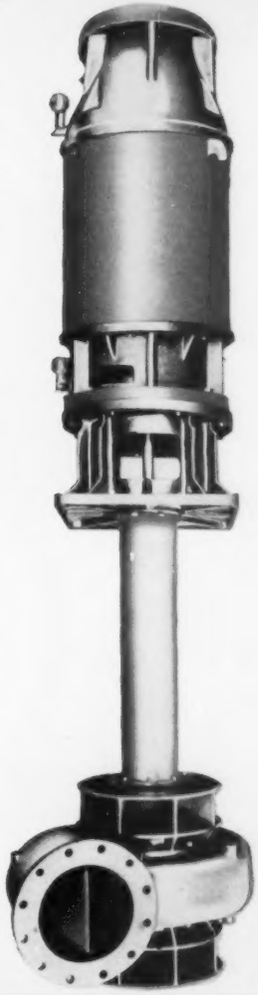

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1. Will not become air-bound.
2. Will handle stock without clogging.
3. May be installed at convenient locations in mill flow line.
4. Operates successfully in basements or on any floor level.
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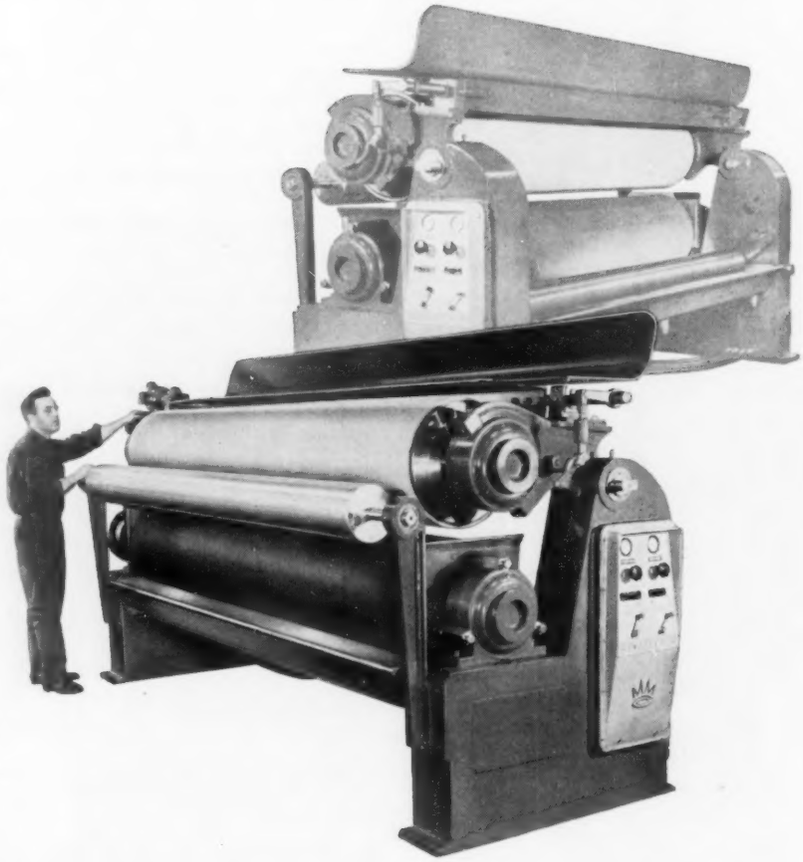

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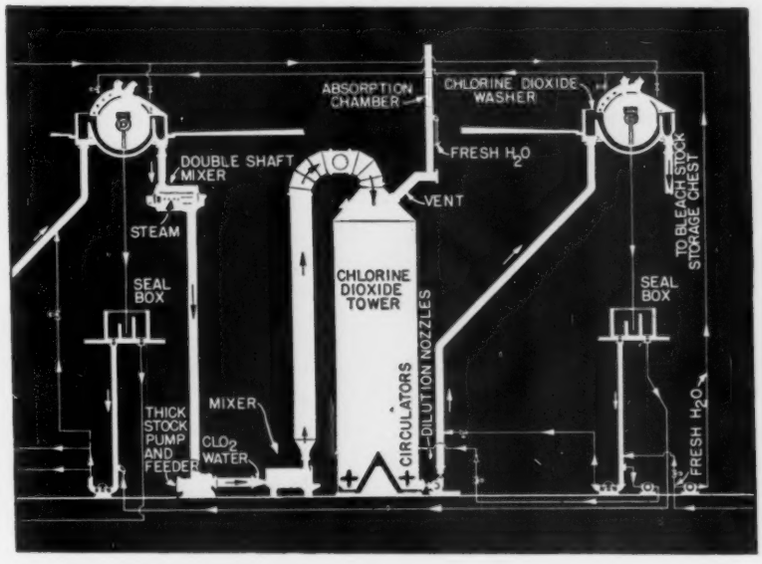

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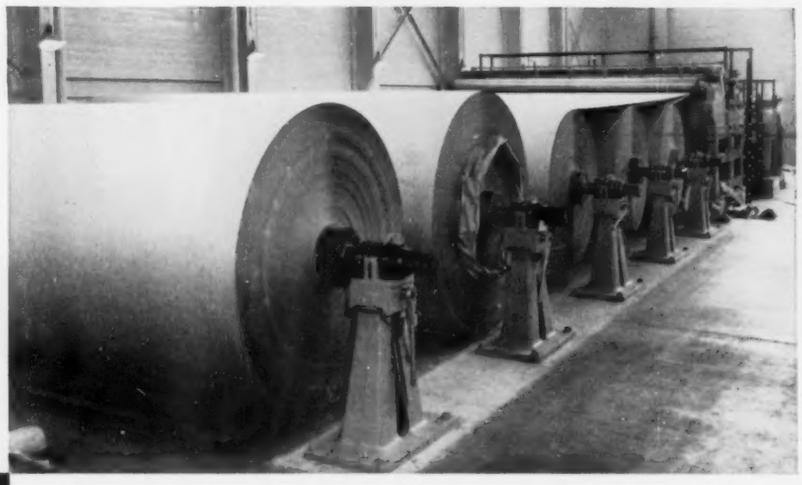

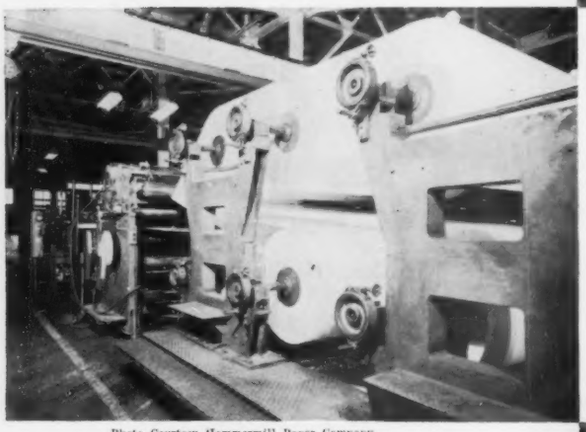

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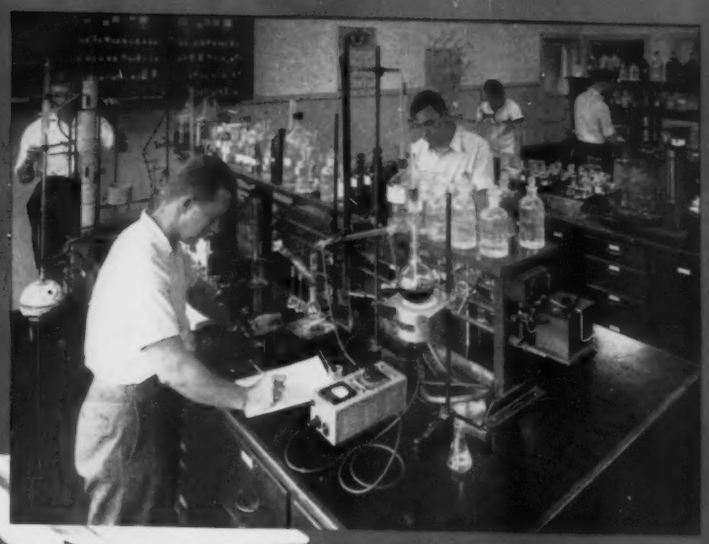

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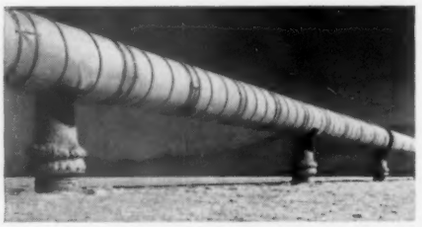
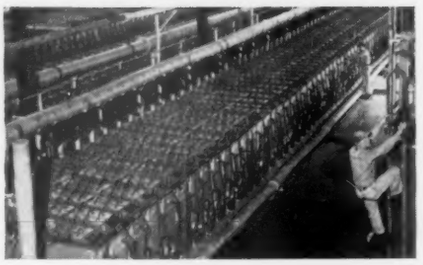
at Trona, California.
Source of *natural* sodium sulphate, essential for quality kraft production



HENDERSON, NEVADA.
Source of $NaClO_3$ for the SOLVAY high-stage chlorine dioxide pulp bleaching process.



Add another step forward in American Potash & Chemical Corporation's continuing diversification program! Trona has long been the leading source of *natural* sodium sulphate (Na_2SO_4) from the brines of Searles Lake, so essential in quality kraft production. Now from American Potash & Chemical Corporation (Nevada) (formerly Western Electrochemical Company) Trona serves the industry with highest purity sodium chlorate, used extensively in the SOLVAY high-stage chlorine dioxide pulp bleaching process. Two dependable sources, two quality products—a combination that can't be beat!

American Potash & Chemical Corporation

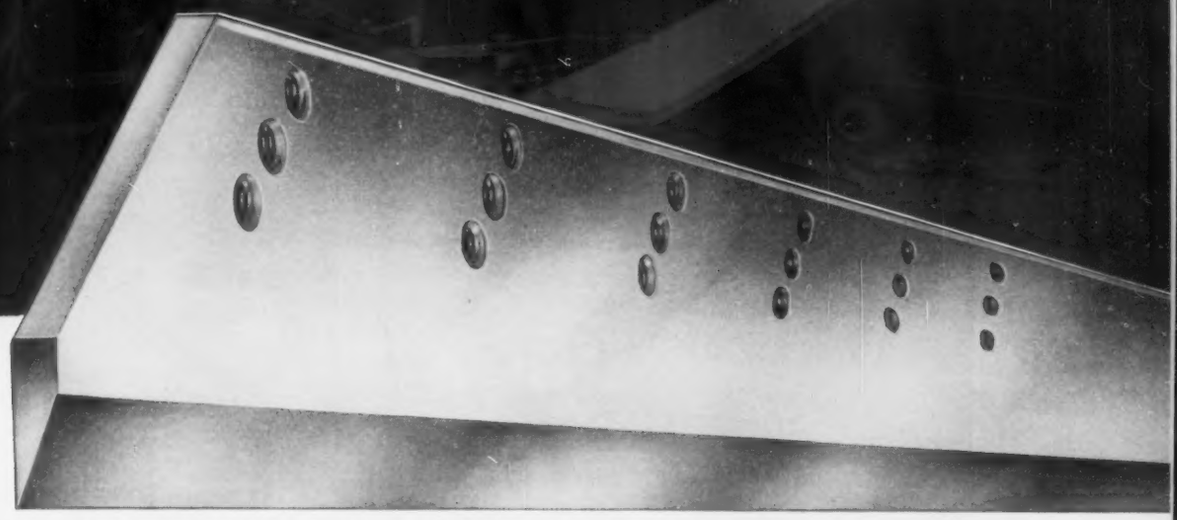
TRONA

Los Angeles **New York** **Atlanta** **San Francisco** **Portland (Ore.)**

Producers of: Borax • Potash • Soda Ash • Salt Cake • Lithium Bromine • Chlorates • Perchlorates • Manganese Dioxide • *and a diversified line of specialized agricultural and refrigerant chemicals*

Plants: TRONA and LOS ANGELES, CALIFORNIA
HENDERSON, NEVADA
(American Potash & Chemical Corporation (Nevada)
SAN ANTONIO, TEXAS (American Lithium Chemicals, Inc.)

BOLTON *High Speed Paper Knives Meet the Challenge*



The rapidly increasing use of coated and mineral loaded papers—with high abrasive action—of tough kraft paperboard and other similar types have created new standards for paper knife performance. Hence was born the need for keener, more durable cutting edges to meet the more rugged, exacting demands placed upon them.

The BOLTON High Speed Paper Knife is licking this challenge every day. Resulting from years of constant Bolton research, it is a precision machined instrument finely fashioned to provide the best combination of toughness and resistance to abrasion.

With the BOLTON High Speed Paper Knife you can expect enduring cutting accuracy from three to nine times longer between grindings than from ordinary carbon steel knives. From BOLTON exclusive analysis steel and scientific control of the heat treating and tempering cycles uniform hardness of the cutting edge is achieved. Advanced techniques of welding solid high speed tool steel to a soft steel backing, found only in BOLTON knives, provide additional advantages. It combines the long, accurate cutting qualities of tool steel with the qualities to resist stress, shock and impact.

The BOLTON High Speed Paper Knife works better, lasts longer on all paper cutting assignments. We sincerely believe it to be absolutely the finest paper knife available. We seek the opportunity to convince you of the highest value to be found in paper knives.

Send today for your copy of the 20-page book on "The Use and Care of BOLTON'S High Speed Paper Knife."

BOLTON EMERSON

John W. BOLTON & Sons, Inc. and The Emerson Manufacturing Co., Division
Lawrence, Massachusetts, U. S. A.

A reputation for leadership

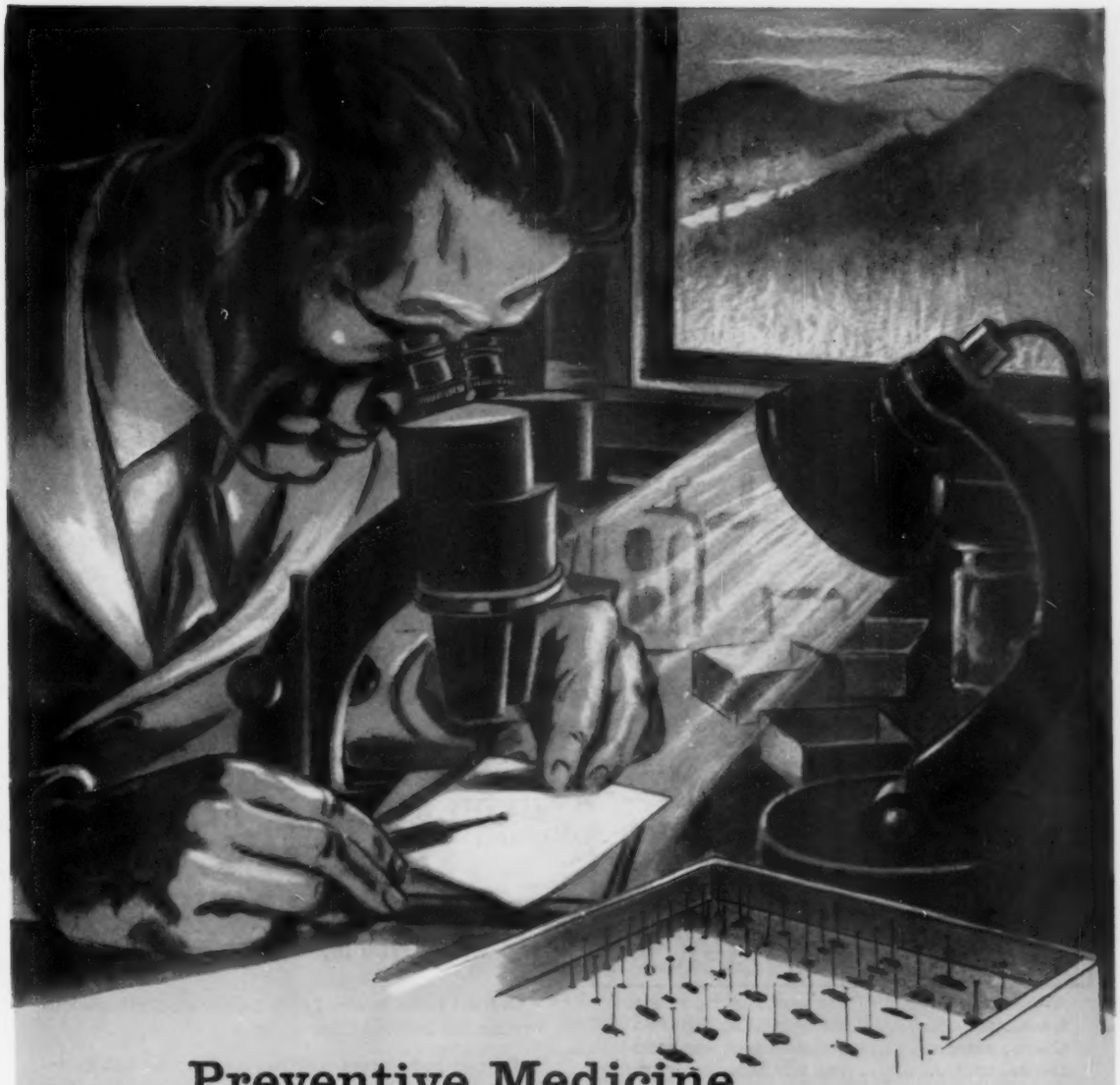
Skill and experience have earned APPLETON MACHINE COMPANY the reputation for *leadership* with the pulp and paper industry. That's why APPLETON was chosen to build this 16 roll, 84" supercalender that sets the pace for glassine production efficiency.

This high-pressure glassine stack combines functional beauty with rugged strength and advanced mechanical design . . . and like all other APPLETON products, it was *custom-built* for the specific job and installation.

Let an APPLETON representative help *you!* He has an unmatched record of problem-solving.

APPLETON MACHINE COMPANY

APPLETON, WISCONSIN

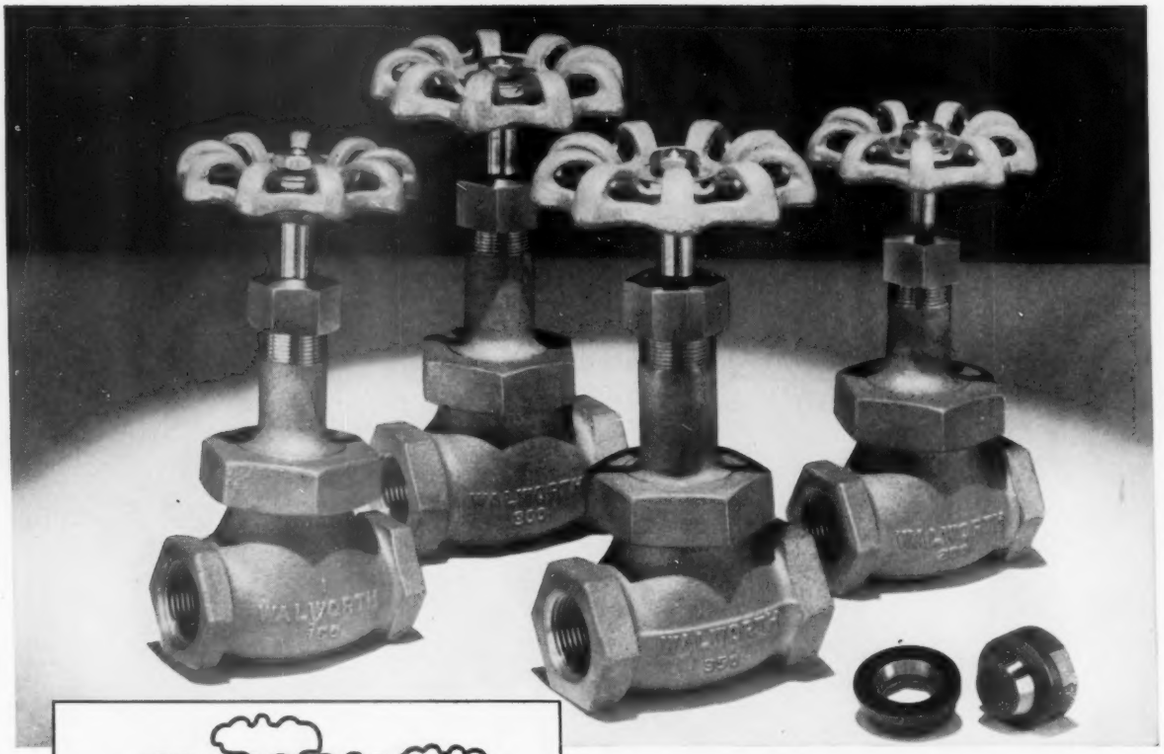


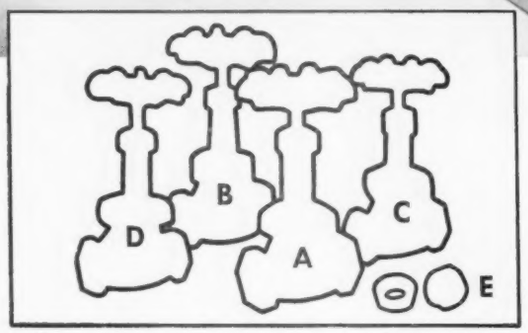
Preventive Medicine

Trees mature, rot, and die in an unmanaged forest. Insects and fire destroy millions of acres of forest annually at more than a billion dollar cost. Bringing death to trees and wildlife, insects and indifference are enemies with which to be dealt.

Weyerhaeuser Timber Company in 1941 initiated preventive medicine in the form of Tree Farms—privately owned lands dedicated to continuous growth of forest crops. On Tree Farms, vigorous protective measures are carried out against forest insects, diseases, and fire. Preventive medicine administered by enlightened management of timberlands insures a constant supply of pulpwood for generations yet to come.

WEYERHAEUSER





A — No. 225P.....350 WSP 550F, 1000 WOG
B — No. 260P.....300 WSP 550F, 600 WOG
C — No. 245P.....200 WSP 550F, 400 WOG
D — No. 237P.....150 WSP 500F, 300 WOG
E — "500 Brinell" Stainless Steel Plug Type Seat and Disc

Walworth offers four lines of Bronze Globe Valves with stainless steel, plug-type seats and discs. Advantages of these valves include:

• **Stainless Steel Plug-Type Seats and Discs,** heat-treated to a minimum of 500 Brinell hardness reduces wire-drawing to a minimum. Seats and Discs are machined and fitted simultaneously, assuring perfect mating.

• **Deep Stuffing Boxes with Glands** are fitted with reinforced, molded packing. Valves can be repacked under pressure when fully opened.

For Longer Bronze Valve Life . . .

"500 BRINELL" PLUG-TYPE STAINLESS STEEL SEATS AND DISCS

150 lb. 200 lb. 300 lb. 350 lb.

• **Oversize Stems,** made of high tensile strength silicon-bronze, assure long life.

• **Rugged Body Hexes,** are flat on top; do not interfere with wrench gripping body-to-bonnet union ring connection.

• **Bodies,** made of Composition M bronze (ASTM B61), have ample wall thickness to provide high safety factor.

• **Patented Handwheels** are air-cooled and designed with a "finger-fit grip." Makes turning easy even when wearing greasy gloves.

• **Identification Plates** secured by lock-washer under stem nut, show Figure Number of valves and make re-ordering sure and easy.

FOR COMPLETE INFORMATION, SEE YOUR WALWORTH DISTRIBUTOR OR WRITE FOR ILLUSTRATED CIRCULAR

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Better Papermaking Performance

for every Stowe-Woodward Rubber Covered Roll

If Stowe-Woodward rolls were delivered from "stock" . . . or made from "stocked" batches of rubber . . . such precise laboratory checking procedure of every roll would be unnecessary. But *every* Stowe-Woodward roll is customed to an individual papermaker's needs . . . and to insure papermaking performance, the laboratory technician duplicates the vulcanizing process with miniature equipment and verifies by actual test the performance characteristics specified. In this photo he is checking the density of a "plug" from a compound prepared for a Stonite press roll.

Stowe-Woodward's unusual degree of quality control can increase paper production in your plant . . . and your Stowe-Woodward Sales Engineer is well qualified to help you solve any rubber roll problem. Why don't you consult him.

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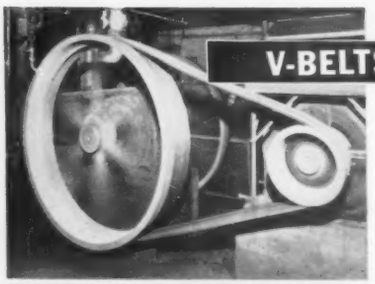
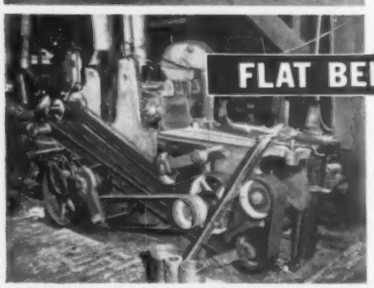
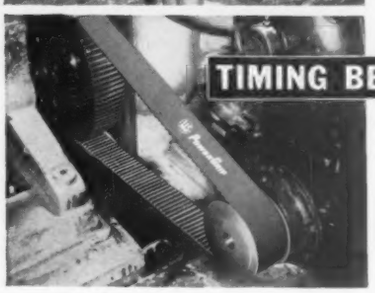
A complete line of

Flat Belts, V-Belts and Sheaves and "TIMING"® Belts and Pulleys







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SHEAVES • FLAT BELTS AND BELTING
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V-Belt Sheaves and "TIMING" Belt Pulleys

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United States Rubber

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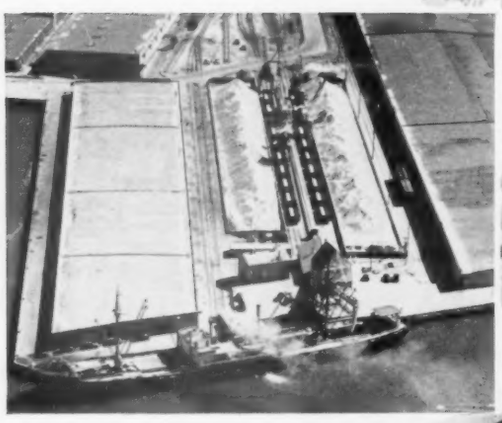
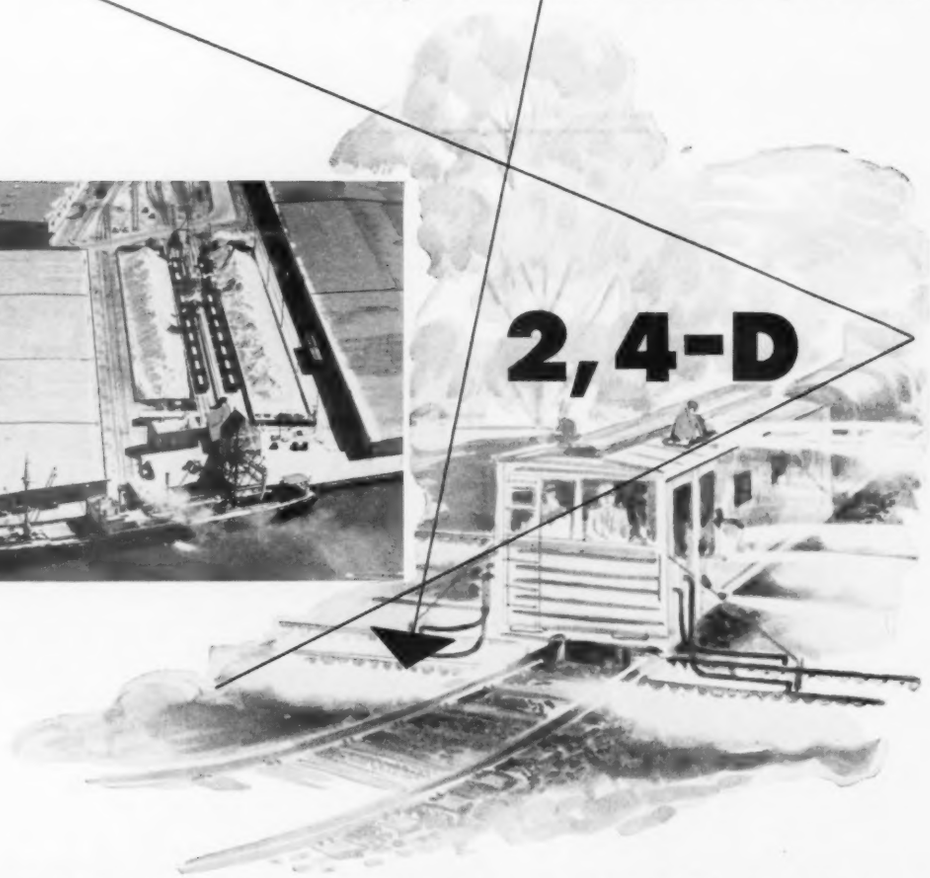
LINKING 13 GREAT STATES WITH THE NATION
B&O

sulphur

helps to create headline products





Naturalists have said that the forests would take over our cities in short order should all human activity cease. Railroads see vivid evidence of this on a small scale. They're constantly battling weeds on rights-of-way, on sidings, on spur lines.

Today, the battle is being fought more successfully than ever before with a new and powerful broadleaf weed killer 2, 4-D. And this chemical is proving useful, too, in suburban areas.

Where does Sulphur fit into the picture? It takes Sulphur to make sulphuric acid. It takes sulphuric acid to make phenol. It takes phenol to make 2, 4-D.

Texas Gulf Sulphur Co.

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Sulphur Producing Units

- Newgulf, Texas
- Moss Bluff, Texas
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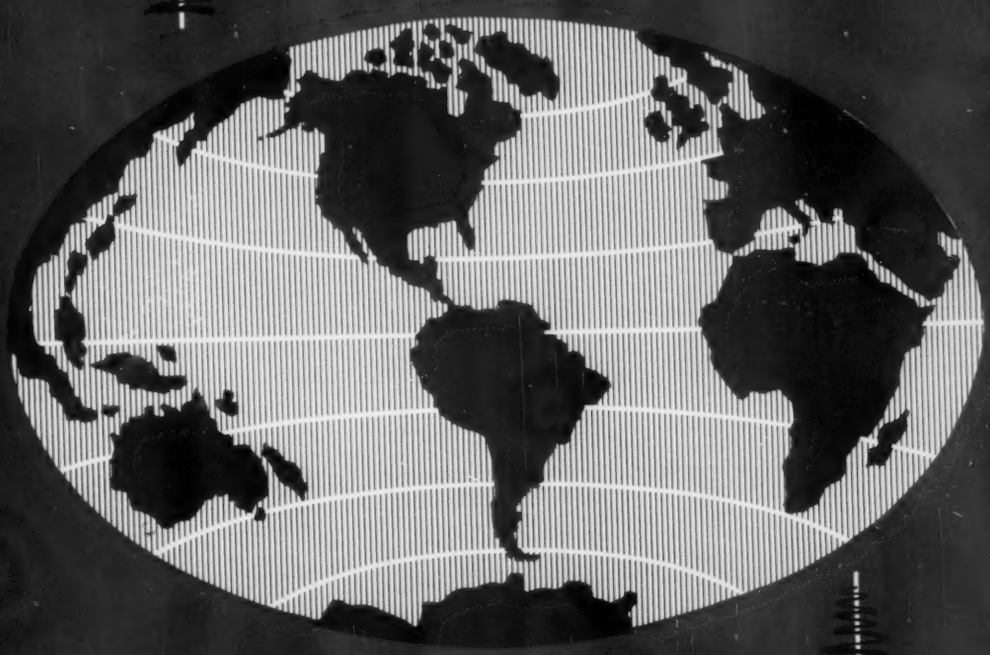
- Worland, Wyoming

WOOD PULP
PAPER



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THEY STARTED THE AMERICAN ALKALI INDUSTRY

These men of Solvay . . . 75 years ago!

Marking our 75th Anniversary this year, we take pride in Solvay's pioneer role in the establishment and development of the American Alkali Industry. But, at Solvay we do not think of pioneering as a picture from the past but as a continuing job for today and the years ahead.

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SOLVAY
75th YEAR
1881-1956

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STRICTLY PERSONAL

Midwest Medley

HOWARD WHITAKER, Mead president, has a new post—chairman of the executive committee. **GEO. H. MEAD,** honorary chairman of the board, will continue on executive committee. Besides Mr. Mead and Mr. Whitaker, **SYDNEY FERGUSON, ALFRED W. JONES, AL H. MAHRT, H. T. MEAD, D. F. MORRIS,** and **C. R. VAN DE CARR** also serve on the executive committee. **WALKER LEWIS, WARREN KAMPF, GEORGE PRINGLE, LEONARD GROWDON** and **RUSSELL SAVAGE** are regular advisors to this top management group.

PETE PETERSON, who has joined the Paper Chemicals Dept., Hercules Powder Co., Milwaukee, Wis., after a number of years' service on the West Coast for Hercules, was happy to find an old classmate in his new territory. He and **CLYDE FALKENDER,** technical director of Charmin Paper Mills, were both of the class of 1939 at Iowa State College. . . . **LEONARD PARKINSON,** Rhinelander paper mill supt., who was born in England, saw a lot of the U.S.A. when he motored with his wife, the former Edna Yohie, and their two children to the Supts. convention at Lake Placid, N. Y., and also visited his wife's Pennsylvania Dutch farming relatives in that state.

STEVE HALEY, Middle West representative for Stebbins Engineering & Mfg. Co., is a proud papa again. He and his wife Marjorie have a third daughter, Kathleen Mary, born Apr. 6 at their Watertown, N. Y. home. . . . **JACK AYERS,** E. D. Jones & Sons Midwest rep, is now the Supts. national affiliates rep for that territory. With his wife, Verda, and their 16-year-old daughter, he makes 312 East Francis St. his home in Appleton. . . . **RICHARD AHRENS,** of Appleton, representative of Impco in the Midwest, was able to attend his son's marriage in Berkeley, Calif., in May. Young Lt. Richard W. Ahrens and his bride are now at the Elgin air force base outside of Pensacola, Fla.

While **BOB LEAF,** vice pres. of Shawano Paper Mills, was busy over the first Lake States TAPPI meeting ever held at the town of Shawano (pronounced Shaw'no), his wife, Jolie, helped out by entertaining ladies who wanted to see the Indian reservation. The Leafs have quite a family now—two boys and two girls, the youngest being twins Nettie and Dannie, 3 years old.

GEORGE UNDERHAY, director of research for Bowaters, whose Central Research is at historic Gravesend, down the Thames from London, visited Wisconsin and Appleton with one of his assistants, young **STANLEY KINGSNORTH,** in charge of chemistry and chem. engineering research at Gravesend. They had been to Bowaters mill in Tennessee.

C. A. FOURNESS, a famed Kimberly-Clark "Idea Man" for 41 years and an important figure in the company's growth through unusual product ideas, etc., has retired into the corporation's Life Members' Club. Mr. Fourness had been assistant to the executive vice president since 1953 and will continue to work on plans for Kimberly-Clark's new plant in Mexico until the end of the year. He holds 38 patents on machines, products and processes, either by himself or with other K-C men. . . . **JOHN G. STRANGE,** pres. of Institute of Paper Chemistry, was honored June 2 by Ripon College. He received an honorary doctor of science degree. Dr. Strange graduated from Lawrence College, is a Phi Beta Kappan.

ROY SIGLER, a veteran of 25 years with Nekoosa Edwards (he started as a trucker in 1930), was named shipping department foreman. . . . **SAMUEL P. MOORE,** chemical engineer at Scott's Hoboken, N. J., mill, has been transferred to the Falls River Paper & Power Co. division of Oconto Falls, Wis. . . . **CECIL J. HESS** is new assistant to the gen. supt., M & O Paper Co., International Falls, Minn. . . . **J. K. CUSHMAN** is due congratulations—he's new chief engineer for Alton Box Board Co. at Alton, Ill.

H. NELSON MOREY, of Champion Paper's Hamilton, O., office, honored with a handsomely engraved plaque by the Butler County, Ohio, Chapter of the National Management Assn. The general office executive won the plaque as a tribute for his role in founding the NOMA. . . . **EDWARD F. KOCH,** of Valley Iron Works at Appleton, was named vice pres. of the Northern Wisconsin chapter of the National Assn. of Cost Accountants. . . . Another papermaker, **ROY E. PICKERT** of the Fox River Paper Co., is secretary of the same organization.

FOLKE BECKER, chairman of the board of Rhinelander Paper Co., has been elected a director of St. Regis, new Rhinelander parent firm. He fills the chair left vacant by retiring **CARL B. MARTIN.** Mr. Becker joined Rhinelander in 1926. . . . **LOUIS EKELIN** has been named asst. systems and procedures accountant and **LEON VYTLACIL** is new asst. supervisor of accounting dept. at Consolidated Power & Paper Co., Wisconsin Rapids. . . . **J. H. (JIM) DAVIDSON,** chief engineer of Mando, and staff have a new "home." This is the company's new central engineering div. at the specialty paper and insulation board mill in International Falls. The division, incidentally, is responsible for all the company's capital improvements.

R. S. FOWLER is new president of Lake Superior Newsprint Co., offices at 919 North Michigan Ave., Chicago. The company was created to handle sale of Great Lakes Paper Co. newsprint. He shares offices with **KEN FOSSE,** Western rep for Canadian Wood Pulp Corp., which sells Great Lakes pulp. Two assistants who have joined Mr. Fowler are **ROBERT E. POWELL** and **GORDON W. MOODY.** . . . **J. FRANK GRAY,** president of River Raisin Paper Co. from 1939 to 1946 and chairman of the board since 1946, has retired. Mr. Gray is one of the pioneers of the Midwest board industry. He was also one of the founders of the Williams-Gray Co. of Chicago, representative of various manufacturers of equipment for mills, but has not been with that firm for many years. He was a director of River Raisin since 1910.

Kalamazoo Valley Section of TAPPI and the Michigan Division of the Superintendents Assn. met jointly at Kalamazoo, May 17. The TAPPI section for the coming year: **PAUL APPLEGATE,** Hercules

Dr. Pearl Heads Lignin Group; Abramson at Appleton Machine

DR. IRWIN PEARL (left), native of Seattle and graduate of U. of Washington there (ph.d. in 1937, master's in 1934) is new Head of the Lignin Group, Institute of Paper Chemistry, Appleton, Wis. Dr. Pearl has devoted 15 years to work on chemical utilization of spent sulfite liquors, both at U. of Wash., where he was on the staff till 1941, and at the Institute since then. He is President of Wisconsin State Federation of Stamp Clubs, his chief hobby. He succeeded Dr. Fritz Brauns as lignin chief at the Institute, the latter having retired and moved to Victoria, B.C. Dr. Brauns was planning some work using Oregon State College lab facilities.

HAROLD ABRAMSON (right) is a new member of Sales Engineering Staff of Appleton Machine Co., Appleton, Wis. He serves under RAY G. BENDER, Manager of Sales Engineering. Mr. Abramson is a native of Eau Claire, Wis., and a graduate of U. of Wisconsin. He was formerly with Central States Engineering Corp.

Powder Co., Chairman; **RAY HALL,** St. Regis Paper Co., Vice Chairman; **E. E. STEPHENSON,** Sutherland Paper Co., Secretary; and **W. O. KROESCHEL,** Michigan Carton Co., Treasurer. . . . **MARSHALL RUTZ,** KVP Co., was elected chairman of the Michigan Supts. and **JOHN DAM,** Allied Paper Mills, first vice chairman; **HENRY BONGERS,** Sutherland Paper Co., second vice chairman; and **VINCENT REDMOND,** Kalamazoo Paper Co., secretary-treasurer. . . .

ELLSWORTH H. SHRIVER, group leader, Products Development, Mead Corp. Research Dept., Chillicothe, O., is new chairman of Ohio section of TAPPI. **MALCOLM P. LYONS** of Champion, Hamilton, is vice chairman; **EDWARD W. PETRICH,** of Howard Paper Mills, Dayton, is program chairman; **RICHARD DININGER,** Sall Mountain Paper Co., Rockdale, is recording secy.; **RAY ROOT,** Champion, Hamilton, is corresponding secy.; **GEORGE GREGG,** Cincinnati Gas & Electric, is treasurer; **W. COATES** is editor.

Southern Sidelights

WILLIAM T. (BILL) WEBSTER, now vice pres. in chg. of planning for National Container Corp., will handle plans for the new $25 million expansion at Jacksonville. He is enroute to Europe to look over foreign mills. Mrs. Webster is with him. **KARL GUEST,** who managed the firm's Valdosta mill when it began, and **JOE MAILHOS,** plant engineer at Valdosta, have been called back to Jax to help Mr. Webster in planning the new mill. **JAKE HAYES** takes over as mgr. at Valdosta. . . . **M. E. BONDURANT,** process products engineer for Socony Mobil Oil Co., will be concentrating on paper mills and other industrial accounts in the southeastern area. He is a graduate of Roanoke College and formerly was with American Viscose Corp. . . . Bowater's monthly magazine THE ARROW reports that there is a used plumbing dealer in Dallas named Carr who attracts a great deal of publicity to his place of business with the sign: "Honest Carr, the used john dealer."

JOHN CHANDLER, Atlantic Beach, Fla., new rep for Vapo Systems, has a son attending Georgia Military Academy in Atlanta who recently made the newspapers by winning several heats in one of the school's toughest swimming meets of the year. . . . Rising costs can have their bright side as witness the recent modernization of Champion Paper's Carolina Div. electrical distribution system which eliminated a maze of heavy copper cables. The 10 tons of copper at today's copper prices brought the Canton mill $9,000—more than the cables cost when they were bought 30 years ago. . . . Incidentally, Champion Paper marks its golden anniversary this year. It is acknowledged nationally as a pioneer in the field of human relations in the South: First to organize a safety committee, first to establish employe credit unions, first to provide income to retired employes, first to offer a wage incentive program and, most recently, first to start a profit sharing plan. That's a pretty impressive lists of firsts.

JAMES T. FAIRCLOUGH, Jr., formerly a chemist at Naugatuck Chemical Co.'s Gastonia, N. C., plant, is new sales representative for the latex and lotol department in Georgia. . . . **J. H. MARTIN,** vice pres. of Sonoco Products Co., Hartsville, S. C., off on a tour of Sonoco affiliates in Australia, India, Switzerland and England, will be accompanied by Mrs. Martin. . . . Industry was saddened by the death of **JIM CRUIKSHANK,** 47, chief of the forest economics research div. of the Southeastern Forest Experiment Station at Asheville, N. C. Since 1942 he had headed the Forest Survey, which periodically inventories and measures trends in the supply of timber available for industrial use in North and South Carolina, Virginia, Georgia and Florida.

EVERETT D. CANN, formerly with Howard Smith Paper Mills, Ltd., is now in the research dept. of Hudson Pulp & Paper at Palatka, Fla. . . . **TILLMAN B. GILLESPIE, Jr.,** has left East Texas Pulp & Paper Co. to become senior design engineer for Bowaters at Calhoun, Tenn. . . . **MERLE A. HEATH** is new associate director in charge of product research in the cellulose and specialties div. of Buckeye Cellulose Corp. at Memphis, Tenn. . . . **RICHARD HERRLINGER** has taken over as chemical dir. of Process Development Laboratory, Arizona Chemical Co. at Panama City, Fla. . . . **CHARLES N. SPENCER** has been named general paper mill supt. of Mead Corp. at Kingsport, Tenn. . . . **RALPH G. YOUNG** has moved from Chester, Pa., to Hollingsworth & Whitney Div. of Scott Paper in Mobile.

WILLIAM B. AMOS, of Atlanta, Ga., has joined Wica Chemicals, Inc., as sales technician serving Georgia, Alabama and Tennessee. Mr. Amos has had wide experience in the textile dyeing and finishing fields and was recently sales technician for Stein Hall & Co. . . . **BEN M. WILLIAMS,** beverage product sales executive of Crown Zellerbach's Gaylord Div. and a veteran of the papermaking

In News—South and West

ERIC ZIMMERMAN (left), longtime Supt. at Chesapeake Corp. of Virginia, West Point, Va., is now Vice Pres. and Production Manager of that company. H. F. G. ANDREAE (right) First Vice Pres. of Columbia River Paper Co. (Parent organization of Oregon Pulp & Paper Co.) and grandson of firm's founder, addressing Oregon Pulp & Paper retirees and guests, including mill foremen, supervisors and management, at a recent dinner in their honor.

industry for the past 50 years, died recently at the age of 73. . . . **K. O. ELDERKIN,** Canadian-born vice pres. and gen. mgr. of Bowaters Southern, is due congratulations. He recently was honored with an honorary LL.D. degree from his alma mater, Mount Allison U., Sackville, N.B., Canada.

JOSEPH M. YOUNG, former field sales engineer for Infilco, Inc., in the Southwest area, has been transferred to headquarters of the Ion-Exchange Dept. of the firm in Tucson, Ariz. He will be replaced by **LEE HISER,** formerly with the engineering dept. in Tucson. . . . Crossett Co. announces two new appointments: **FELIX M. HAMMACK,** a chemical engineer, has joined the technical service dept. of Crossett Paper Mills and **NORMAN SKRASTAD,** a graduate of U. of Illinois, has joined the technical sales service of the paper mill.

KIRKWOOD F. ADAMS, a vice pres. and division manager, is new executive vice pres. and division manager of Halifax Paper Co. **H. W. ELLERSON Jr.,** general supt. of the Roanoke Rapids plant, becomes a vice president, and **K. D. RUNNING,** pulp mill supt. is named a director. Mr. Adams and Mr. Ellerson were already directors. Mr. Adams came to Roanoke Rapids in 1945 as res. mgr.; previously he was with Albemarle Paper Mfg. Co. of Richmond, parent organization of the Roanoke Rapids plant, from 1926. Mr. Ellerson was first employed at Roanoke Rapids as a chemist in 1940. Mr. Running came to Roanoke Rapids in 1948.

PHILIP C. BROWNELL has been promoted from asst. gen. mgr. to gen. mgr. of Ecusta Paper Div., Ecusta Paper Corp., Pisgah Forest, N. C., announces **N. H. COLLISON,** exec. vice pres. of the parent Olin Mathieson Chemical Corp. **LAWRENCE F. DIXON,** vice

pres. of Ecusta Paper Corp. and gen. mgr. of the division, resigned for health reasons. Mr. Brownell, also a vice pres., joined the company in 1947 as counsel.

Notes from Northeast

Overheard in order department of a New England paper company: "No, Bill, figure that ream weight again. It can't be minus." Another voice: "We had an order in 1935 once (that's going back some) for vanishing paper. It had a minus ream weight. We had a terrible time figuring the tonnage. It kept going down on us."

At Deferiet, N.Y. several changes have been made in St. Regis' Central Technical Dept. **JAMES B. SISSON** is now supervisor of research and development and will supervise research projects within the dept., including those concerning pulp, paper, containers and thermoplastics for packaging. He was previously extrusion engineer in the lab. **DONALD M. FERGUSON** is now supervisor of technical service to manufacturing division, St. Regis, and will coordinate transfer of laboratory developments and information into mill scale production. **R. A. DANDO** has been named chemical engineer in charge of water treatment for all mills of St. Regis and will coordinate treatment of boiler water, process water and effluent in the mills and will work with consulting firms as part of his assignment. **C. WELLS CLARK**, formerly in charge of the technical control labs at Deferiet, is now general supt. at Bucksport. He's a '39 grad of Syracuse U. with a degree in pulp and paper engineering. His wife and David and Suzanne, twins, joined him in June after close of school.

While we're in the Deferiet area . . . **DAVID C. KNOWLTON**, president of Knowlton Brothers, advises that **DR. FRITZ ROSENTHAL** has joined his company in research and development department and will work with **HORACE SPENCER**. German-born and educated, Dr. Rosenthal came to the U.S. in 1936 and has been with Armour Research Foundation and Nashua Corp. He is married and has 2 daughters who also joined him after close of school. They will live in Watertown at 830 Sherman St.

HUBERT F. PARKER has been promoted to division engineer for New York & Penn, reporting directly to the general supt. and will assume full responsibility for directing all maintenance, power, instrument, water and fire protection activities of Lock Haven and Castanea mills. **GARRETT C. MITCHEL** is now maintenance supt; **ROBERT O. EDGAR** becomes office manager of the Lock Haven mill to succeed the late **C. A. STOUCK. CHARLES A. CRUSE** is now assistant office manager. . . . **E. NOBLES LOWE**, secretary and general counsel, West Virginia Pulp and Paper Co., has been elected president of the New York group of the American Society of Corporate Secretaries. He succeeds **MALCOLM BLACK**, sec-treas. of Union Bag and Paper Co. . . . **GEORGE O. TRUDEAU**, sales engineer for Holyoke Machine Co., was a very proud father recently when he walked down the aisle with his daughter at her wedding. George is the fellow driving that black Buick convertible you're liable to meet this side of the Rockies.

DAVID A. SEALEY has retired as secretary of the eastern division of the National Paperboard Assn. He joined NPA in 1934. Industry members feted him June 14 at the Biltmore Hotel with a testimonial luncheon. . . . **HERMAN C. WEBER** moves up to purchasing agent at Hammermill Paper Co., succeeding **EDWARD F. FLETCHER**, who held that post from the founding of the department in 1916 until his retirement. Mr. Weber has a b.a. from Penn State College and joined Hammermill in 1943. Stepping in as assistant purchasing agent is **ROGER G. STURTEVANT**, former senior buyer. . . . In Hammermill's paper mill **RONALD "BOOKIE" BUCHMEYER** has been promoted to technical coordinator succeeding **CARL ANDERSON** who became assistant paper mill superintendent. **GEORGE BAILEY** moves into postion of general foreman in the paper mill. He started as a broke hustler in 1933 with Hammermill.

Erickson Elected Director, McGillicuddy in Sales Post

RUSSELL F. ERICKSON (left) has been elected a Director of Rayonier Inc., succeeding to the position left vacant by death of D. S. Gottesman. Mr. Erickson, 45, has been a Vice President since 1950. Minnesota-born, he graduated from U. of Minnesota, joined Rayonier in 1946 at Fernandina Beach (Fla.) mill, in 1948 became Res. Mgr. there. He is in charge of engineering and manufacturing. DAN McGILLICUDDY Jr. (right) has been appointed Asst. Mgr. of Domestic Sales for Rayonier, it is announced by Michael A. Brown, Gen. Sales Mgr. Mr. McGillicuddy will manage chemical cellulose sales to newly-developed cellulose-using markets in the U. S. as well as domestic silvichemical and paper pulp sales, according to Waldo H. Backer, Mgr. of Domestic Sales. Mr. McGillicuddy joined Rayonier after he graduated as a chemical engineer from U. of Washington in 1946. He has served in sales promotion, industrial and public relations and advertising. He is a native of Aberdeen, Wash., served in WWII as a naval officer.

DANIEL O'REARDON, a '55 grad of N. Y. State College of Forestry, becomes paper mill foreman.

LOUIS J. BAUDIS has been elected a member of the board of The Samuel M. Langston Co. He was named vice president in charge of engineering and manufacturing in Sept., 1955. . . . **HUGH D. JORDAN** has been elected assistant treasurer, Brown Co., Berlin, N. H., according to **STUART W. SKOWBO**, senior vice president and treasurer. Mr. Jordan is a graduate of Cornell U. in 1937 and was formerly assistant treasurer and assistant to the president of Gould Paper Co. . . . In Brown's engineering dept., **HENRY STAFFORD**, chief power engineer, takes on supervisory responsibility for the power and steam department. **WILLLIAM MacDONALD** will continue as manager of the power and steam department. **JAMES EADIE**, chief mechanical engineer, will be responsible for all engineering and major construction projects other than steam and electrical. . . . **LAURENCE F. WHITTEMORE**, chairman, has been named by President Eisenhower to his committee on education.

IRWIN A. ZUCKERMAN has been named vice president in charge of sales, advises **WILLIAM MAZER**, president, Hudson Pulp & Paper Corp. He succeeds **T. H. MITTENDORF**, now executive vice president. . . . **GEORGE E. DYKE**, chairman and president, Robert Gair Co., Inc., advises that an executive committee of six directors has been elected by the board to exercise certain functions previously performed by the board. They include Mr. Dyke; **RAYMOND DEVOE**, senior vice pres.; **ROBERT L. FITTS**, vice pres. in charge of kraft bag and paper operations; **HARRY E. COLLIN**, senior partner of Collin, Norton & Co.; **HUGH C. LAUGHLIN**, exec. vice pres. of Owens-Illinois Glass Co.; and **PARKER NEWHALL**, partner in the firm of Kelley, Drye, Newhall and Maginnes. **WILBUR F. HOWELL**, secretary, has resigned but will continue on special assignments.

PHILIP W. THOMAS, manager, Rumford Falls Power Co., was honored as citizen of the year by the Rumford Lions Club. . . . **LEO LANDERS**, formerly with Brown Co., Berlin, N. H., has joined Merrimac Paper Co., as beater room superintendent.

Far West Flashes

The "Heap Big Scott Production Tribe" (in real life the managers of all Scott plants) was greeted in Pacific Coast Indian Chinook jargon by **PAUL C. BALDWIN**, vice president from the West Coast Division. It fitted in with the Northwest Indian theme at their annual conference, held in mid-May at Harrison Hot Springs, B. C. **EDWARD J. GAYNER III**, pres. and gen. mgr.,

STRICTLY PERSONAL

Brunswick P&P, was toastmaster for a banquet. . . Exec. Vice Pres. **R. C. MATEER** announced plans to expand at Everett (see GROWTH SECTION). This Scott plant managers' conference was the first ever held on the West Coast and the first to include representatives from the Mexico City and Vancouver, B. C., operations. Mr. Baldwin was chairman. The affair opened May 14 at Harrison Hot Springs and closed at the Everett plant May 19. The 33 men toured Westminster Paper Co., the subsidiary Coos Bay Pulp Corp. plant at Anacortes, Wash., and woods operations at Hamilton, Wash.

Top management changes announced by Crown Zellerbach's Western Waxed Paper Div.: **DAVID BENJAMIN,** former pres. of Waxide Paper Co. (purchased by CZ Jan. 1956), Kansas City, promoted to asst. gen. mgr. at Western Waxed San Leandro (Calif.) headquarters; **E. A. MITCHELL,** also of Waxide, to staff mgr. at San Leandro; **GEORGE DONALD,** res. mgr. of Portland Western Waxed plant, to San Leandro as gen. sales mgr.; **MOSS BARR,** sales mgr. San Leandro plant, to res. mgr. Portland plant.

GORDON PETRIE, Western sales mgr. for Black Clawson Co., is passing around cigars. His wife Virginia presented him with their third child—Craig Allen, also number three son. The Petries have moved into their new home at Lake Grove, Ore.—502 S. W. Allen Rd., phone NEptune 6-2722. . . . **HAROLD K. ZELLERBACH,** pres. of Zellerbach Paper Co., has been elected a trustee of his alma mater, U. of Pennsylvania. Both he and his son, William, attended the university's Wharton School of Business.

73 Years in the Industry

Seventy-three years in a supervisory capacity in pulp and paper is represented by these two West Coast executives, ART PALMER (left), Groundwood Supt., Crown Zellerbach's West Linn, Ore., mill and W. R. (BILL) MacGILLIVRAY, Gen. Pulp Mills Supt., Powell River Co. They renewed their longstanding friendship when mechanical pulp men met in the British Columbia newsprint town recently.

The **RAY SMYTHE CO.,** representatives of Rice Barton Corp., Heppenstall Co. and other products, has moved its Portland office. The new address for **RAY** and **BOB** is 729 S. W. Alder St., Portland 5, Ore. They have suite 511 in the Park Building. Phone numbers are CApitol 3-0502 and 3-2238. . . . Miss **JEAN CHRISTINE CHARTERS,** daughter of **GEORGE W. CHARTERS,** retired CZ Camas man and now an affiliate of H. A. Simons Consulting Engineers at Vancouver, B. C., and Mrs. Charters, marrried **PETER VAN HOOMISSEN,** of Portland, Ore., on May 12.

SVEN FAHLGREN, sales engineer for Bird Machine Co., attended the joint Pacific Coast Supts.-TAPPI meet at Gearhart, Ore. . . . **GEORGE A. LAHUSEN,** onetime asst. gen. safety supervisor for CZ at Portland, has been promoted to gen. safety supervisor of Crown Z. He succeeds **V. C. GAULT,** who has retired. . . . **J. D. ZELLERBACH,** pres. of Crown Zellerbach Corp., received the 1956 Business Statesman of the Year award presented annually by the National Sales Executives, Inc. Honors were made at the Conrad Hilton Hotel in Chicago. . . . **HUGH C. OSBORN,** West Coast rep of Lockport Felt Co., and wife Carrol became parents again with the arrival of their third boy, John Matthew, on April 26.

ROBERT W. OLIN, of Potlatch Forests Inc., Lewiston, Ida., is newly elected chairman of Operational Fixed Microwave Council, the national group representing mobile communications and microwave facilities. For years Mr. Olin has been prominently identified in the industrial communications since the original formation of Forest Industries Radio Communications on which he is serving as national executive committee chairman. . . . **LLOYD BOOTS** has joined the lab staff at Simpson Paper, Everett, Wash. He transfers from Simpson Logging Co. at Shelton.

Column from Canada

SUCCESS STORY: When **LEON** and **WALTER KOERNER** escaped their native Czechoslovakia a few months before the jackbooted Nazis moved in they considered themselves lucky. They were luckier still when chance took them to British Columbia where they made their mark in developing Alaska Pine & Cellulose, with its two big pulp mills and other operations. Last year Leon felt that he owed something to British Columbia for providing such an opportunity so he contributed to an educational fund. His gift: One million dollars. Walter continues the family's desire for community service as chairman of the gifts division of Vancouver's Red Feather campaign next fall.

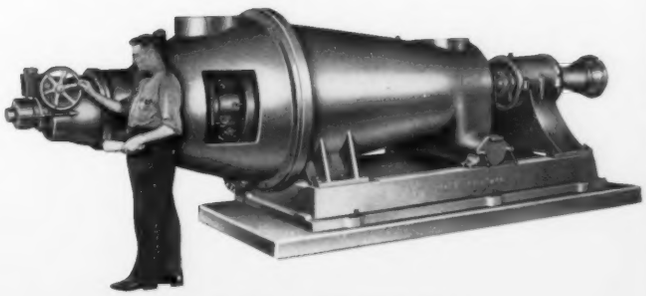
Appointments in Far West

PRESTON C. READ (left) is the new Asst. Mill Manager at Ocean Falls division, Crown Zellerbach Canada. A graduate of McGill University in electrical engineering, he was previously with the Consolidated Paper Corp. at Three Rivers, Que., in the capacity of paper mill superintendent. R. R. Ferguson is Mill Manager at Ocean Falls. ROBERT O. BEATTY (right) has affiliated with Western Kraft Corp., Portland and Albany, Ore. as Assistant to Pres. Ira C. Keller. For past three years he was Northwest Public Relations Representative for Crown Zellerbach Corp.

B. W. POWER has been named a director of Eddy Paper Co. as well as treasurer. He has also been appointed treasurer of the E. B. Eddy Co., a subsidiary. . . . Industry was saddened by the death of **FLOYD L. KURTZ,** gen. mgr. of Kingcome Navigation Co., a subsidiary of Powell River Co. He died suddenly at his Vancouver home. Mr. Kurtz had been continuously associated with Powell River Co. since 1922 and was the oldest employe of the company in Vancouver from point of service. He played a big part in developing Powell River Co.'s unique self-loading and dumping steel pulp log carriers.

JAMES SHEASGREEN has resigned as vice pres. of Canadian Western Lumber Co. He is one of the best known loggers in British Columbia and grew up with Comox Logging & Railway Co., logging subsidiary of Canadian Western, which later merged with CZ Canada. Jim is also former president of Pacific Logging Congress.

J. A. KYLES has been named secretary of Powell River Co., succeeding the late **J. H. LAWSON.** He joined the company as an accountant 31 years ago and became assistant resident manager at Powell River before World War II. He served overseas as a squadron leader in the Royal Canadian Air Force and on his return was appointed company comptroller, later elected a vice president.



LEVIATHAN Our largest Jordan

MAJESTICS
at Weyerhauser, Longview

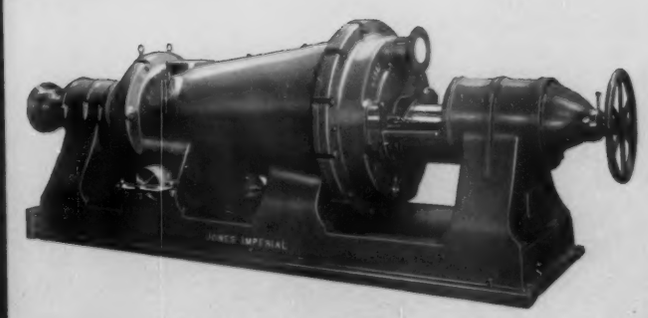
Meet the members of a *Famous Family*

Jones JORDANS

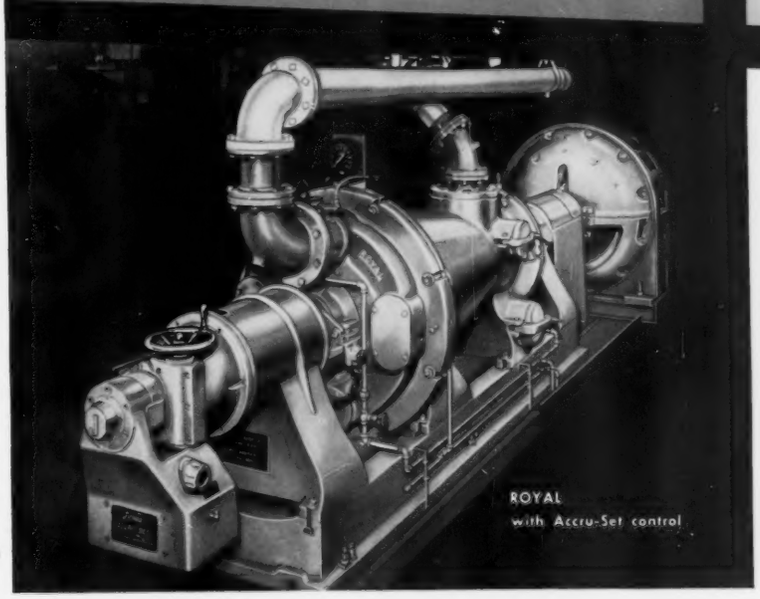
Built into all Jones Jordans are exclusive features developed from more than a century of service to paper mills the world over: streamline design, maximum operating efficiency, ease of maintenance and low operating cost. Ask your Jones representative about additional features.

The Jones "family" of nine Jordan sizes, from Leviathan to Midget — permits selection of exactly the right size and type to handle every requirement, with a wide choice of fillings to meet any condition.

For full details, write for Bulletin EDJ-1007A.



IMPERIAL Popular "work horse"



ROYAL
with Accru-Set control

BUILDERS OF QUALITY STOCK PREPARATION MACHINERY

Jones

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Pittsfield, Mass.

In Canada: The Alexander Fleck, Ltd., Ottawa

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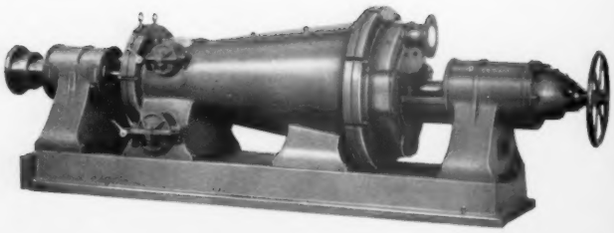
CASTLE & OVERTON, INC.
New York 20, N. Y.

Foreign Licensees:

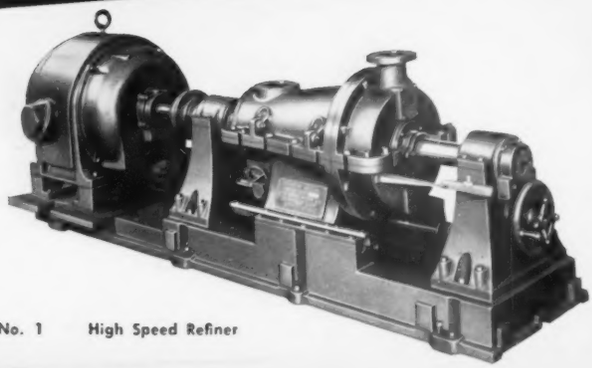
FRANCE	Batignolles-Chatillon
SPAIN	Gabilondo
ITALY	de Bartolomeis
JAPAN	Mitsubishi



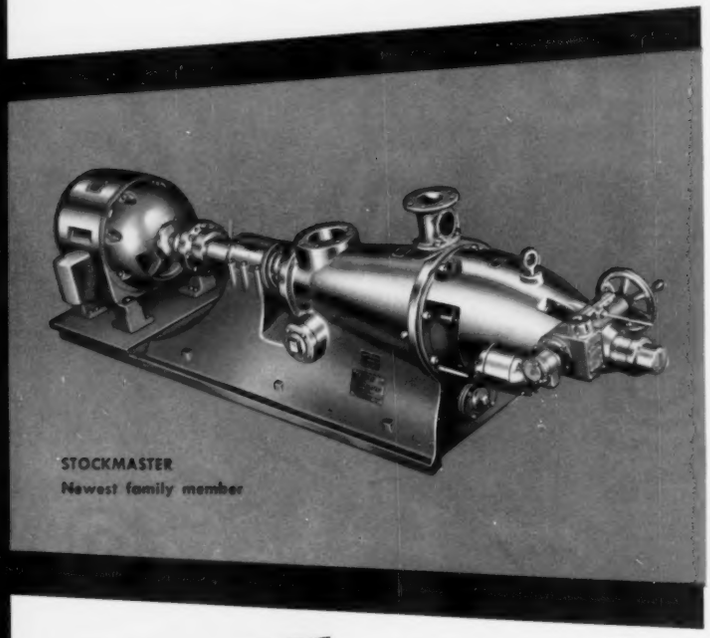
STANDARD New design features

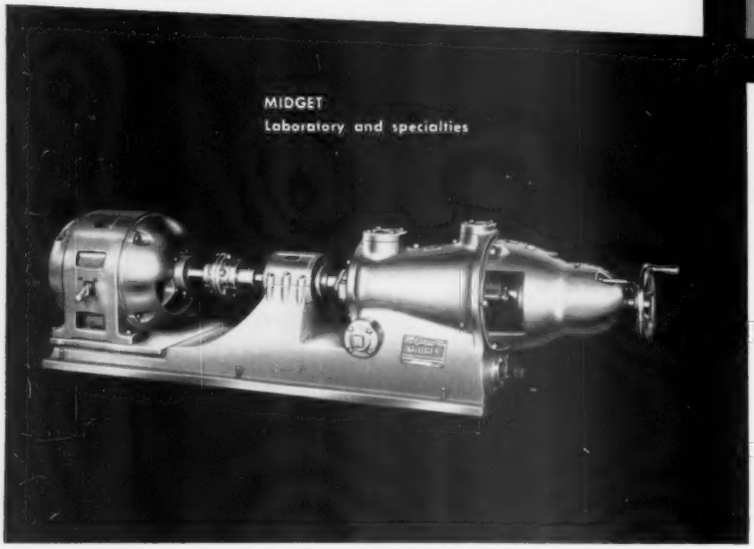
There's a Jones JORDAN for every mill need

Mountings for all Jones Jordans are so designed that bearings with their housings form self-contained units which remain on the shaft—need not be removed when plug is withdrawn. On most models, there is a choice of plug adjustment mechanism: hand wheel, worm gear, or completely automatic Accru-Set — a Jones exclusive.



No. 1 High Speed Refiner





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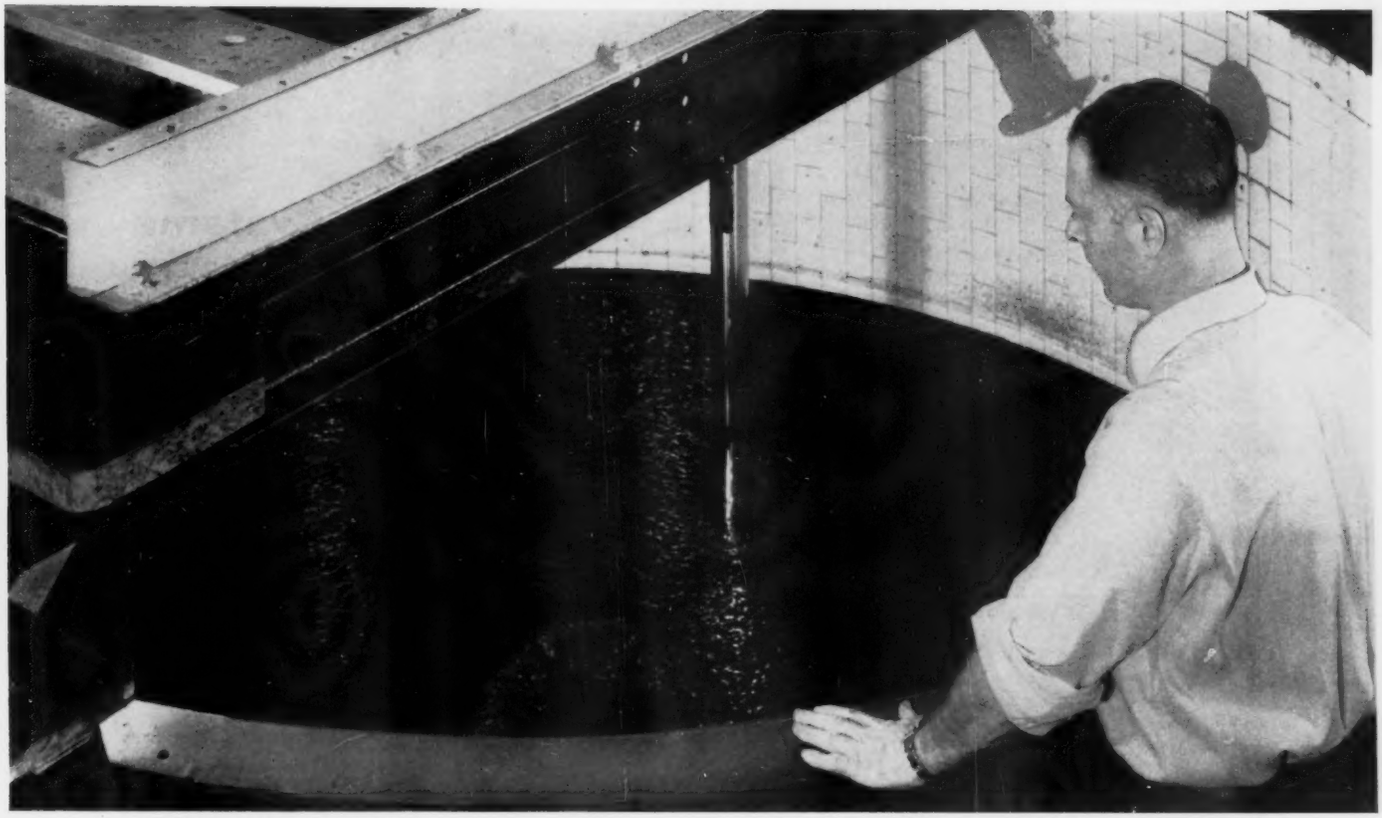


EASTMAN KODAK COMPANY, Rochester, N.Y.

STOCK DOESN'T STRATIFY in this LIGHTNIN-mixed chest. From top to bottom, every pound stays at the same consistency. Thorough mixing levels out consistency fluctuations of incoming stock, providing a uniform effluent.

How Kodak gets **uniform stock** *out of the machine chest*

Here's evidence that the way you mix stock in the chest can make a powerful difference on the wire.

At Eastman Kodak Company, a uniform sheet is a "must" in producing top-grade photographic papers. Stock settling or stratifying in the machine chest could make the sheet vary, first above, then below the critical weight limits.

Kodak helps solve this quality problem with LIGHTNIN Mixers in mixing and machine chests. The LIGHTNIN you see here puts just enough horsepower into the chest to keep stock flowing in a diagonal pattern, constantly intermixing and equalizing the entire chest contents. Another factor in maintaining uniformity, in this installation, is a level-control in the machine chest.

Uniform within 0.2%

Incoming stock is dispersed uniformly throughout the chest. Consistency differential between top and bottom of the chest averages only 0.1%, with 0.2% the maximum range.

This thorough mixing "irons out" the fluctuations in stock consistency caused by heavier or lighter stock coming into the chest.

It provides a highly uniform effluent, greatly reducing demand on the consistency controller. Rewards include a uniform sheet, obtained with a minimum of headbox corrections.

How you can get results like these

You can get results comparable to these, out of your stock chests. Blend stock of different types; control color; add size and other ingredients—with full uniformity—in as little as *six minutes.*

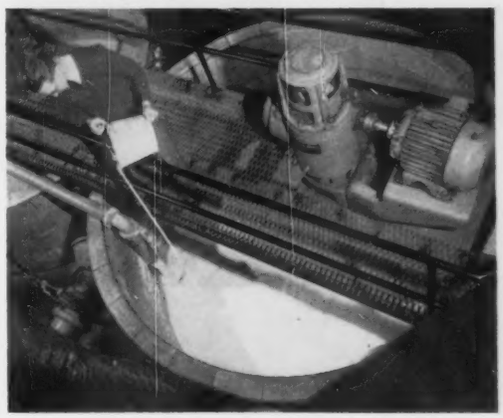
LIGHTNIN Mixers are delivering uniform stock in more than 35 mills. In practically every case, mixing results are fully predictable—unconditionally guaranteed.

For quick, competent help, call in your LIGHTNIN Mixer representative. He's listed in Thomas' Register. Or write us direct.

"Lightnin® Mixers"

MIXCO fluid mixing specialists

NO BAFFLES are needed in chest. LIGHTNIN Mixer, positioned off center, produces uniform stock in six minutes from standstill, without swirl or vortex.



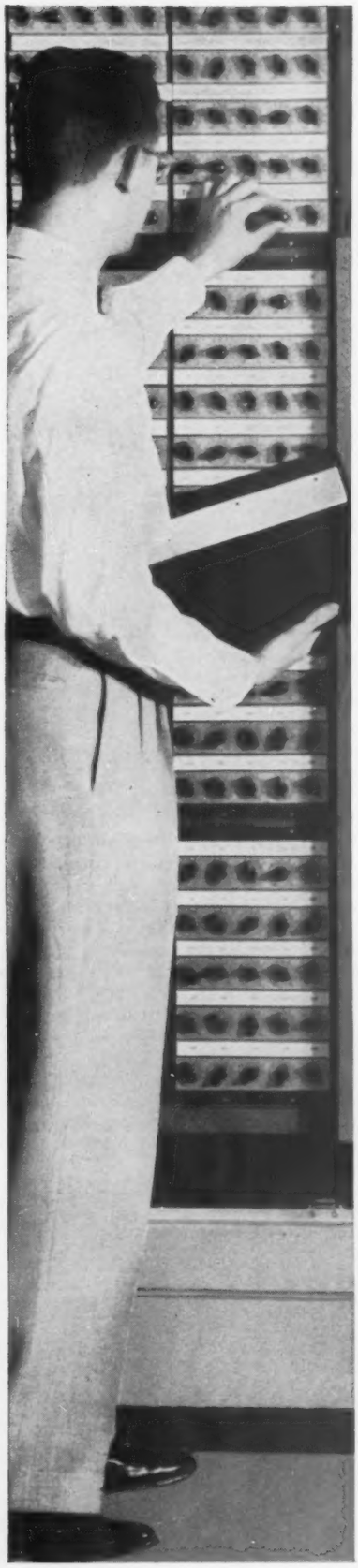
FOR LATEST MIXING INFORMATION and full description of LIGHTNIN Mixers, send for these helpful bulletins:

- ☐ B-102 Top or bottom entering; turbine, paddle, and propeller types: 1 to 500 HP
- ☐ B-103 Top entering; propeller types: ¼ to 3 HP
- ☐ B-108 Portable: ⅛ to 3 HP
- ☐ B-104 Side entering: 1 to 25 HP
- ☐ B-112 Laboratory and small-batch production types
- ☐ B-109 Condensed catalog showing all types
- ☐ B-111 Quick-change rotary mechanical seals for pressure and vacuum mixing
- ☐ Paper stock mixing data sheet for figuring mixer requirements

Check, clip, and mail with your name, title, company address to:

MIXING EQUIPMENT Co., Inc., 141-g Mt. Read Blvd., Rochester 11, N. Y.

In Canada: Greey Mixing Equipment, Ltd., Toronto 10, Ont.



Panalog Information Systems guide management in raising plant output and profit

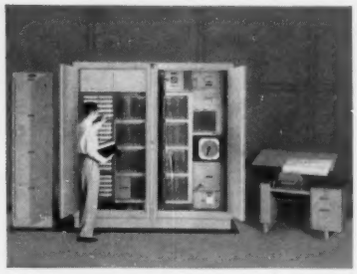
Panalog 605 Information System supplies management control information. Now, operating personnel and management can receive organized digital information on any process, instantly and continuously. Information can be presented in a variety of forms for immediate control action as well as for engineering and accounting analysis. A typical presentation method employs an electric typewriter and patented log chart. Readout can also be made on punched or magnetic tape, punched cards, or can be fed directly to computers.

Periodically logs and continuously scans. A precision servo measuring system quantizes process variables during automatic, periodic logging. A high-speed electronic measuring system detects off-normal conditions during continuous scanning of all variables. Normal and return-to-normal values are printed in black—off-normals in red. A complete log of all variables as well as a summary of off-normals can be made at any time.

Completely flexible and expandable. Panalog components are standardized, packaged modules. The system can be easily expanded or modified in the field. The Panalog 605 is sufficiently flexible to supply digital information for any management requirement.

Write for literature. Literature presenting a comprehensive treatment of the Panalog 605 is available. If you wish, a Panellit representative in your area will be happy to discuss the possibilities that a Panalog Information System offers your company.

Full scale, adjustable, high and low off-normal limits are provided for each input variable. Basic system capacity, 200 points with one electric typewriter — can be expanded. Accuracy, ±.25% of full scale range. Logging speed, approximately one line per minute. Scanning speed, five points per second, between logs.



Logged values are grouped by processing unit on chart. Audio-visual alarms accompany detection of off-normals. When scanning, off-normal values are identified and printed in separate chart area. Totalized and averaged values as well as plant efficiencies can be automatically computed and recorded by the system.

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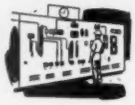
Engineered Information Systems For Industry



Graphic Panels Control Centers

Panalarm Annunciators

Instrument Services Division

PANELLIT

PANELLIT, INC.

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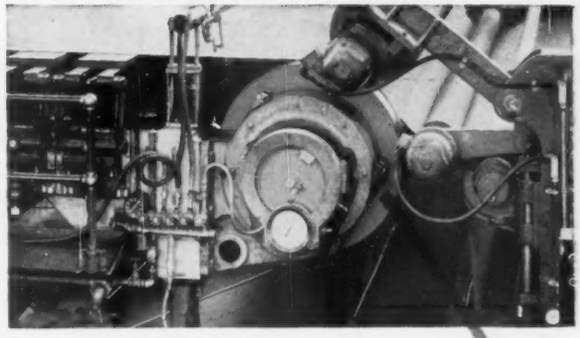
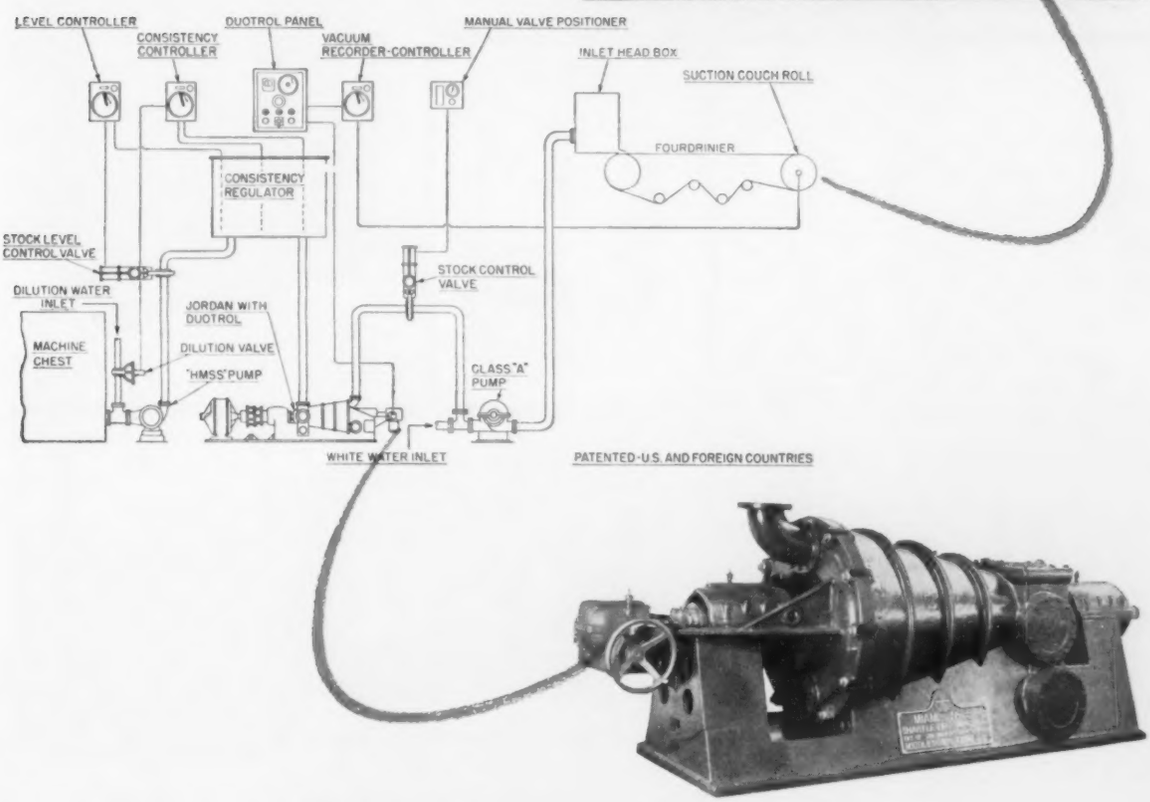
Panellit of Canada Ltd., Toronto 14

Let the Formation on the Wire Control Your Jordans





With this Black-Clawson system you can make the variations of the vacuum at the suction couch control your jordan plug settings automatically and maintain uniform stock treatment.

Duotrol* plug adjusters on your jordans are sensitive to changes in the vacuum caused by variations in fibre length and freeness of the stock being formed on the wire. The Duotrol units respond by automatically varying the jordan plug settings to compensate for these variations.

You can get a full explanation of the advantages of this system which is being successfully used in many mills. Contact the Shartle Division. *Trademark

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Belt conveyor scale and instrument
Read-out to auto-typewriter or tape puncher
Sequence batcher for manual programming
Punch card operated sequence batcher
Desk instrument for weighing
Desk instrument for weighing and printing

Now...we're way beyond weighing–electronically!

The Fairbanks-Morse line of electronic instrumentation performs many functions beyond the elementary process of weighing. It will, for instance, register and record weights at a remote location. It will perform automatic sequence batching—say, from a punch card. It will translate weight messages into the language understood by automatic typewriters, automatic adding machines, tape punchers, other data processing machines. It will control a complete plant materials flow program.

This instrumentation is now available with Fairbanks-Morse truck and track scales, axle-load scales, warehouse and portable scales, and many other types of weighing machines.

The weight message is created in the electronic load cell. Fairbanks-Morse employs it in two ways. The *Full Electronic* system utilizes multiple load cells. In the *Levetronic* system, a single load cell is incorporated in a conventional lever system. (Your present lever scale can probably be converted to *Levetronic*.)

New Fairbanks-Morse literature is available on all these electronic scales, batchers and instruments. Write today. Fairbanks, Morse & Co., Scale Division, Dept. PP-7, 600 S. Michigan Ave., Chicago 5, Ill.

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a name worth remembering when you want the BEST

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HEAVY DUTY SUCTION SECOND PRESS...
as installed on existing newsprint machines at the Gatineau Mill of the Canadian International Paper Company.

The use of corrosion resistant steel shells for rubber covered suction press rolls has made possible higher nip pressures and the use of larger diameter granite top press rolls and oil hydraulic loading. These improvements also provide a more compact arrangement and easier control. After the installation of this unit, a comparison of the new moisture conditions with those of the original second press showed an increase in water removed of more than half. This results in a sheet entering the dryers about 2% more dry—that is, with 9% less water to be evaporated. A considerable advance in operating efficiency with lower production costs has thus been obtained.

DOMINION ENGINEERING
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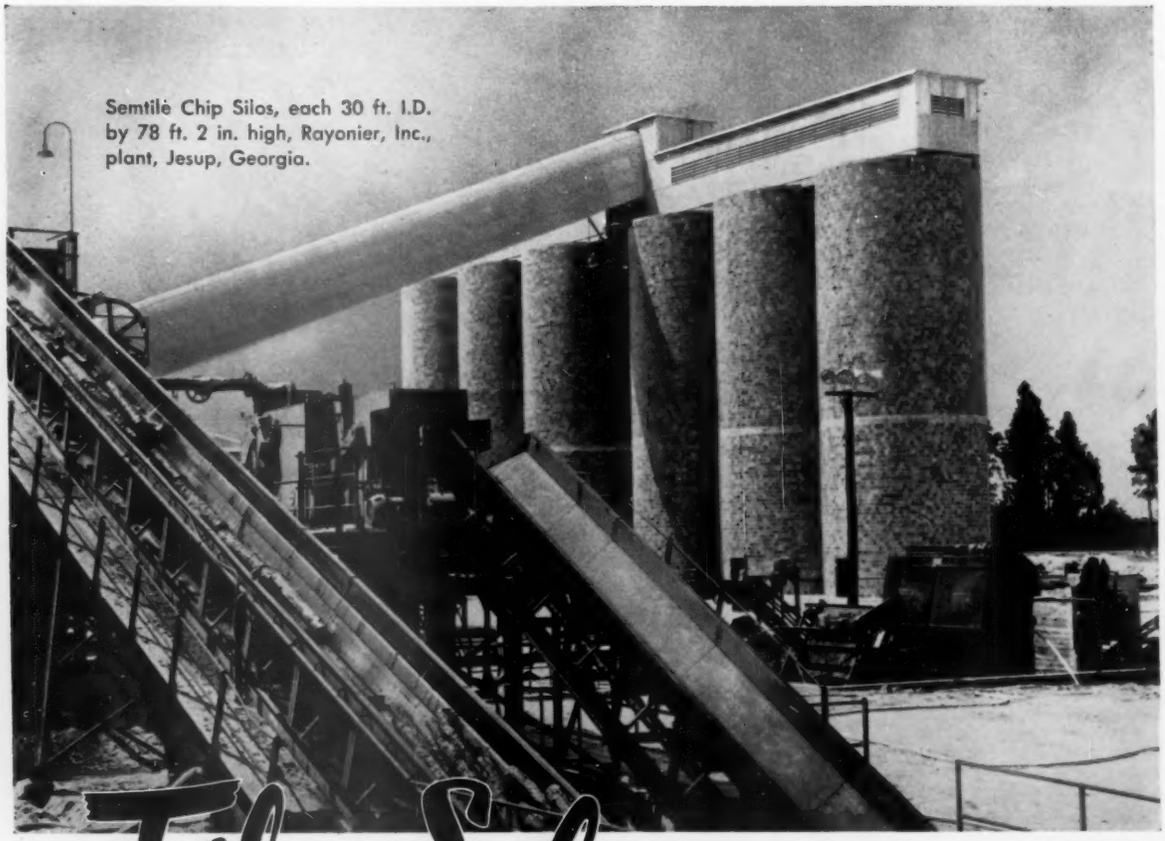
PAPER DIVISION
MONTREAL TORONTO WINNIPEG VANCOUVER



Semtile Chip Silos, each 30 ft. I.D. by 78 ft. 2 in. high, Rayonier, Inc., plant, Jesup, Georgia.

Tile Silos

for Storage of Dry Materials

These enormous chip silos, engineered and erected by Stebbins, are steel-reinforced concrete faced inside and outside with vitrified tile. No forms were required—a Stebbins construction method that results in substantial savings.

If you require facilities for storing materials—dry or wet—in large or small quantities—it will pay you to get Stebbins' recommendation. Or if you need corrosion-resistant process vessels, Stebbins' unequalled experience and facilities for the application of linings and the construction of tile can be extremely valuable to you.

Write for Bulletin A-153

SINCE 1884
Specialists in Design Installation and Servicing of Linings and Tile Tanks

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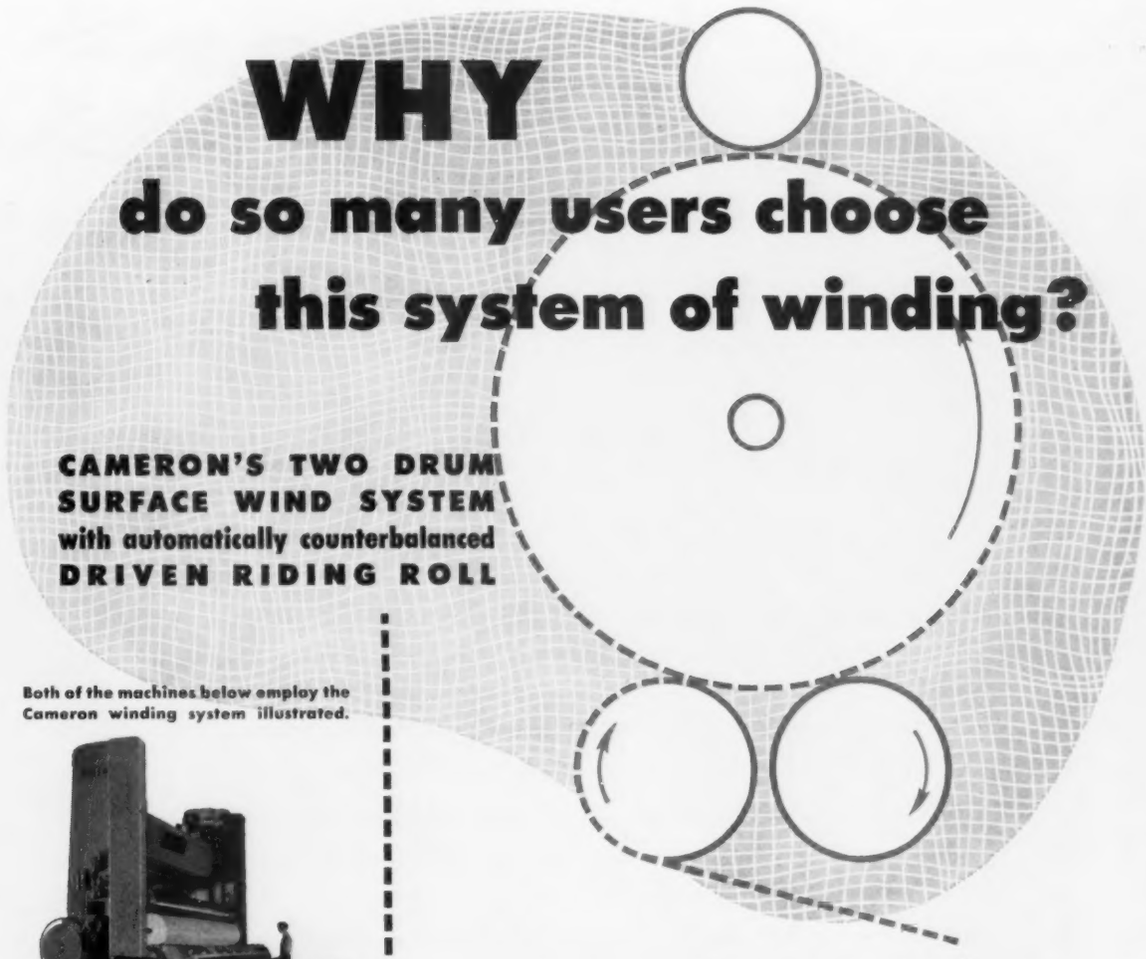
Engineering and Manufacturing Company, Watertown, N. Y.

STEBBINS ENGINEERING CORP. - 1504 TOWER BLDG., SEATTLE, WASH.

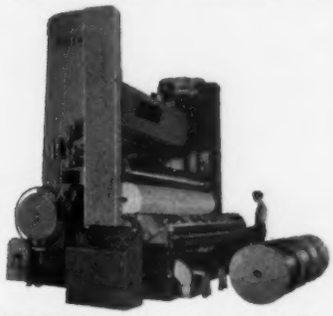
CANADIAN STEBBINS ENGR. & MFG. CO., LTD. - CASTLE BLDG., MONTREAL, CANADA

WHY do so many users choose this system of winding?

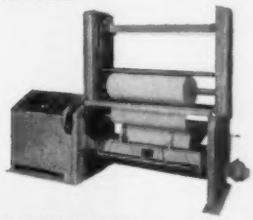
CAMERON'S TWO DRUM SURFACE WIND SYSTEM with automatically counterbalanced DRIVEN RIDING ROLL



Both of the machines below employ the Cameron winding system illustrated.



IMPERIAL high speed mill type winder. Speeds up to 7000 fpm*. Up to 72″ rewind capacity. Built in widths to suit requirements.



CAMACHINE 400 versatile slitter-rewinder for finishing rooms and converting plants. Speeds up to 1000 fpm*. Maximum rewind capacity 30″. Widths 32″, 42″, 52″ and 62″.

DIFFERENTIAL WINDING

For off-caliper webs such as some laminated or wax coated papers, a Cameron duplex winder using the differential winding system is recommended.

LOOK AHEAD . . .

When your attention is absorbed by the more dramatic features of new Camachines it's easy to overlook, or to take for granted, something so simple as the Cameron winding system. Yet that is where good winding must start.

Unless you get off to a good start, you can't expect to get all of the requisites of good winding . . . wrinkle-free rolls, uniformly controlled density, smooth straight sides, elimination of snap-offs, high production speeds.

Ask why Camachines are chosen to serve the world's fastest papermaking machines on all types of paper, from the lightest weight to the heaviest board. And in finishing rooms and converting plants, too. A big part of the answer is right there in Cameron's two drum surface wind system with automatically counterbalanced driven riding roll.

To get off to a good start . . . and to stay ahead . . . ask for the winding system that has successfully served thousands of users through years of high-speed, low-cost dependable production. Call or write to Cameron today for complete technical information.

CAMERON MACHINE COMPANY 1906-1956 50th Year Camachine

*Speed depends on characteristics of material, strip width and roll diameter.

and you'll wind up with CAMERON

CAMERON MACHINE COMPANY, 61 Poplar Street, Brooklyn 1, N. Y.

AA-318

AMERICAN (DISC-TYPE) SAVEALL

Handles 1600 GPM at

Installed late in 1955 at St. Regis Paper Company's Bucksport, Maine Mill, this 9 ft. by 12 disc American Saveall was specified to handle 1200 GPM. However, with only 10 of its 12 discs in use, this new machine, equipped with a rubber covered fabricated center shaft of special design, is handling 400 GPM over and above its original design capacity.

Operating data at St. Regis substantiates the overall efficient application of the Saveall — cloudy water — 2.62 lbs./1000 gal. and clear water — .37 lbs./1000 gal. at a speed of 65-80 S.P.R.

The American Disc-Type Saveall is available in two sizes — 9 ft. dia. with a maximum of 12 discs having 1300 sq. ft. filter area requires only 23 ft. x 12 ft. floor space, and 7 ft. dia. with a maximum of 8 discs and 560 sq. ft. filter area requires 8½ ft. x 15½ ft.

Outstanding operating advantages include — large filter area and high capacity with minimum floor space, easy and quick replacement of disc sectors, and fully automatic and continuous operation.

For more information on the American Disc-Type Saveall write for Bulletin 701-R. Dorr-Oliver Incorporated, Barry Place, Stamford, Connecticut, U. S. A.

American T. M. Reg. U. S. Pat. Off.

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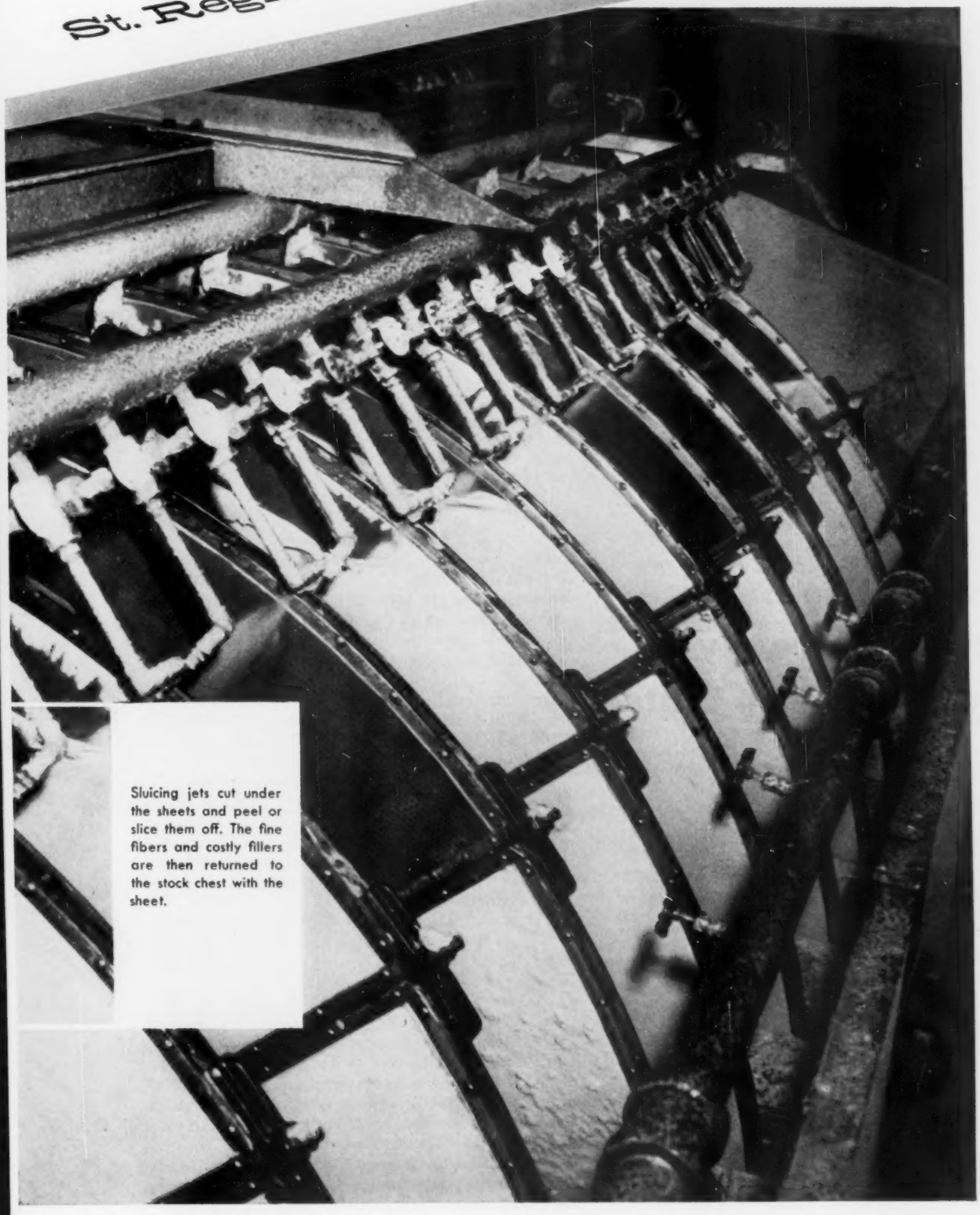
St. Regis Paper Company



Sluicing jets cut under the sheets and peel or slice them off. The fine fibers and costly fillers are then returned to the stock chest with the sheet.

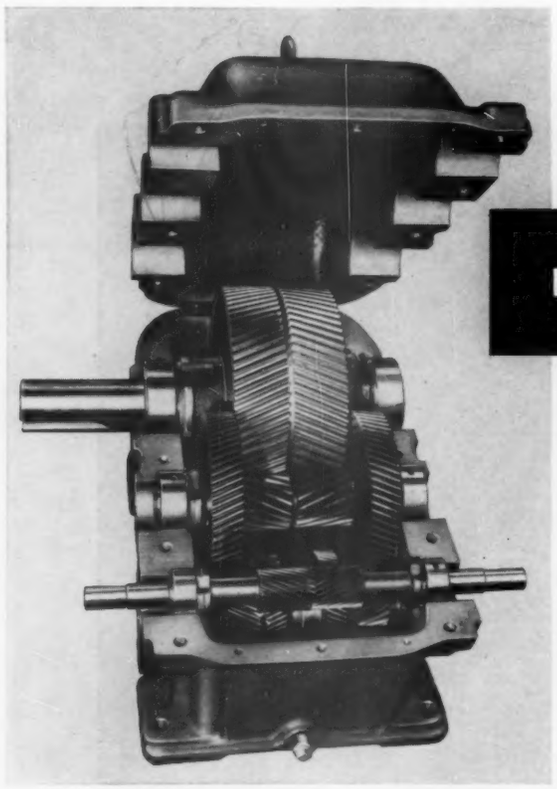


Photo shows triple reduction speed reducer, typical of Western Gear's high quality design and construction.

POWER TRANSMISSION TIPS

How To Use Service Factors Correctly In Selecting Gear Units

By Glenn Jorn

Industry Specialist-Forest Products, Western Gear Corporation

Experience in the gear industry has led to the adoption of a rule of thumb:

"The life of a gear unit increases in proportion to the cube of the service factor."

To illustrate this we have shown in the table below how much additional life can be gained with a small increase in service factor.

Original S. F.	Increased S. F.	Resulting Increased Life
1.0	1.25	Nearly Doubled
1.25	1.50	1.73
1.50	1.75	1.58
1.0	2.0	8.0

The first example in the table shows that you can nearly double the expected life of a gear unit by increasing your service factor from 1.0 to 1.25. The cube of 1.0 is still 1.0 and the cube of 1.25 is 1.95. The increased life shown in the last column is obtained with a very small increase in first cost.

Catalog HP ratings are for 8 to 10 hours' service per day under uniform loads. Manufacturers' catalogs show tables that classify your load and recommend service factors for most standard applications. If there is anything about your application that is unusual, or if downtime would be unusually costly, a more thorough study of service factors is warranted.

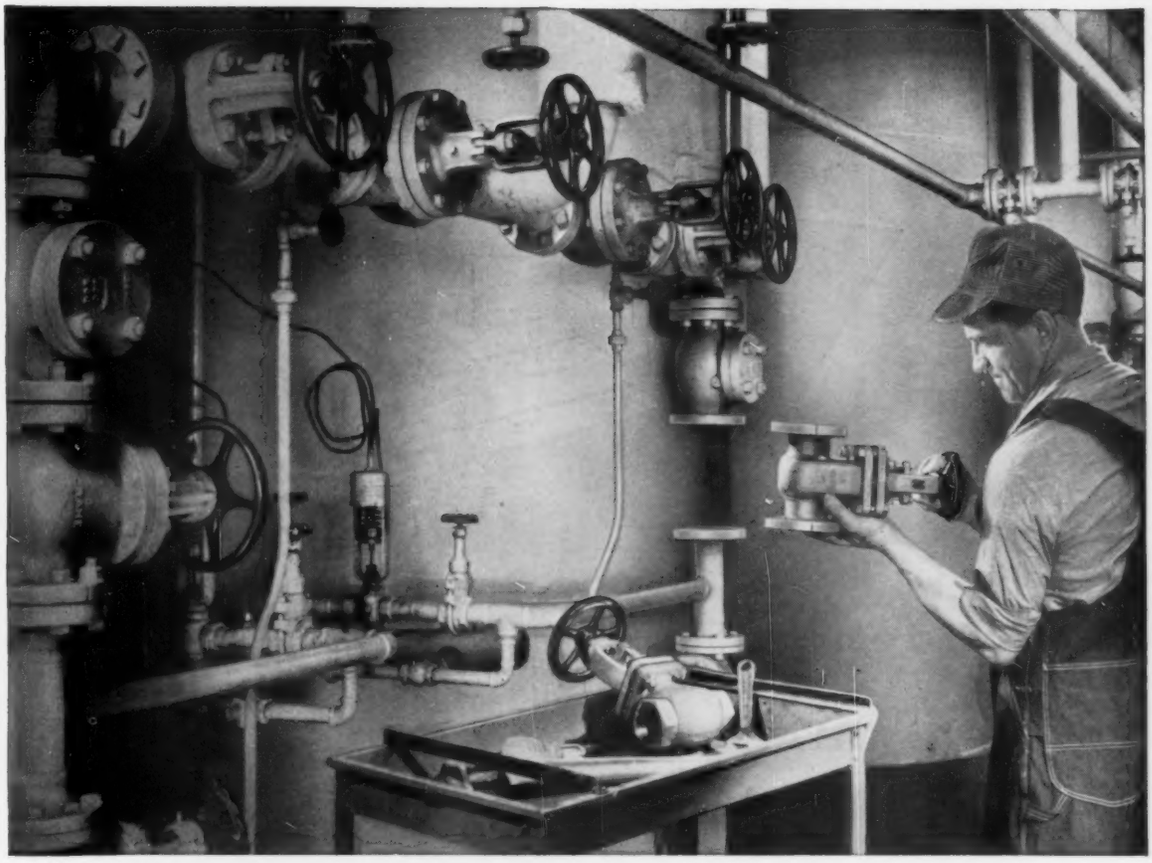
Gear units are designed to handle *momentary* overloads up to double the catalog rating without failing. The thermal rating is the load that the gear unit can continuously transmit under normal ambient conditions without overheating. The thermal rating should equal or exceed the HP transmitted before applying any service factor.

In well organized lumber, pulp and paper industries, shutdown periods are planned and scheduled beforehand. An unscheduled shutdown resulting from gear failure can be extremely costly in lost production, time and dollars. It can even become a safety hazard. Extra service factor is the least expensive insurance obtainable against such failures and loss.

A test stand is used only intermittently and may become obsolete in a few years. For this application strength is more important than wear, and a minimum service factor may be adequate. One precaution – if it is a variable speed test stand, be sure to size your components on the maximum torque condition and specify your maximum speed.

If every 0.1% efficiency is of great importance, remember that heavily loaded gear units are generally more efficient than lightly loaded gear units. This may call for a decrease in service factor.

Take advantage of the services of your Western Gear application engineer. He can make available to you experience accumulated since 1888 by Western Gear, a leader in the field of design and manufacture of mechanical power transmission equipment. A complete line of speed reducers is offered in all shaft arrangements, horsepowers and ratios to solve your gear drive problem efficiently and economically. Write on your letterhead for Bulletin 5402 which gives details and engineering data. Address General Offices, Western Gear Corporation, P.O. Box 182, Lynwood, California.



Corrosion meets match in Crane 18-8 SMo and Craneloy 20 valves

It's unanimous! These Crane valves for the process industries were *especially designed* of Crane alloys to cope with costly corrosion and to cut replacement costs.

The gate valves feature a simple, split-wedge disc construction which permits discs to rotate freely within guides and to seat tightly at all points on the seat perimeter. The free movement of the disc, plus uniform seating and unseating loads, minimizes galling and seizing, reduces wear and allows smooth operation under all conditions.

Globe and angle valves now feature a modified plug-type disc that combines the advantages of the easier seating of the narrow ball-to-flat seat and the high resistance of the wider plug-type disc to corrosion, erosion and cutting. In addition, these valves offer a new swivel disc-stem connection that seats the disc squarely every time. Minimum clearance eliminates vibration.

These valves are available in 18-8 SMo and Craneloy 20 . . . in gate, globe, angle and check patterns . . . ½" to 6" . . . screwed or flanged ends. Rated 150 p.s.i. at 500° F.—230 p.s.i. at 100° F. *For more detailed information*, confer with your CRANE representative or write to the address below, for the 12-page circular AD-2080.

Split-wedge disc gate.

Swivel disc globe.

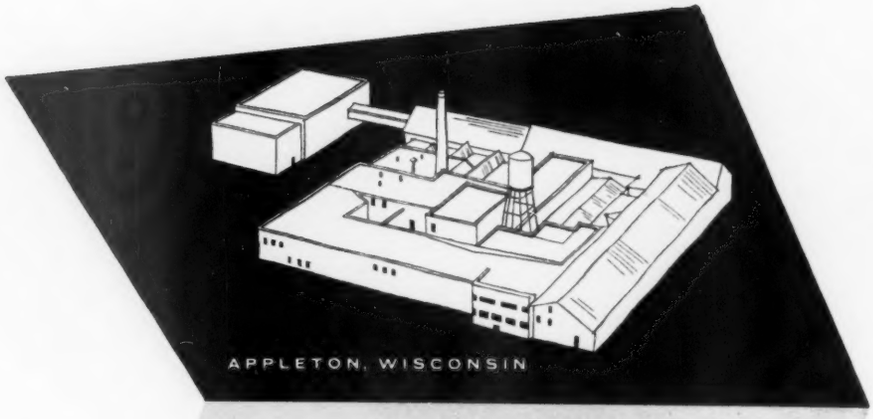
Crane trunnion-mounted split-wedge disc combines the benefits of free rotation with uniform seat load pressure.

New swivel disc stem connection in globe and angle valves permits the disc to swivel freely on contact with seating surfaces.

CRANE VALVES & FITTINGS

PIPE • KITCHENS • PLUMBING • HEATING

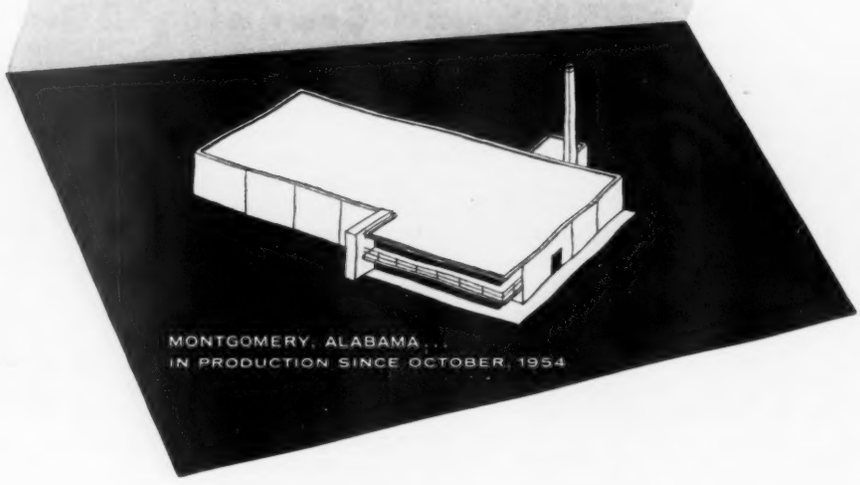
Since 1855—Crane Co., General Offices: Chicago 5, Ill. Branches and Wholesalers Serving All Areas



APPLETON, WISCONSIN

Confidence....in the paper industry

Foresight..... to anticipate changing conditions and requirements of the paper industry with new manufacturing facilities



MONTGOMERY, ALABAMA...
IN PRODUCTION SINCE OCTOBER, 1954

Appleton Wires are Good Wires

Appleton Wire Works, Inc.
GENERAL OFFICES, APPLETON, WISCONSIN

DOW

Only a short time has passed since Dow introduced Separan 2610 to the pulp and paper industry. Our hopes were high, for this revolutionary flocculant promised improvements and economies for many of the industries' operations. Several mills tried it immediately. Now the results are in . . . a few of which we pass along in this

FACTUAL REPORT

on Separan 2610, new high-speed flocculant

FILLER RETENTION—By adding one pound of Separan 2610® per ton of finished paper to the head box feed, one mill reduced titanium dioxide requirements 11%. *Net* savings: $5.25 per ton of finished paper! Other plants report large reductions in filler and fiber losses with as little as 0.25 pounds of Separan 2610 per ton.

FLOTATION TYPE SAVE-ALLS—In a typical unit, use of 1 to 5 ppm Separan 2610 in conjunction with 30% reduction in normal alum loading gave fivefold improvement in effluent clarity. The floc blanket was stabilized, and the entire unit operates more efficiently and at higher capacity.

PROCESS MILL WATER—Another mill increased process water capacity by 50% with 0.15 ppm Separan 2610. In addition, the total flocculant cost was reduced 30%!

NEW DISPERSER

CLARIFICATION OF WHITE LIQUOR—With loadings of 5 to 10 ppm Separan 2610, freshly causticized liquor has shown faster settling and better clarity. Settling rates in several white liquor clarifiers have been doubled at a treating cost of a few cents per ton of pulp.

SETTLING OF BLEACH LIQUOR—Here, too, mills testify to great improvements at only 0.02 to 0.03 pounds per ton of lime. In fact, reports tell of remarkable savings and results in practically every flocculating operation where Separan 2610 has been put in use.

OTHER USES—On a laboratory scale, Separan 2610 shows promise in white water and de-inking waste clarification at 0.05 to 5.0 ppm loadings; in lime mud filtration at 1.0 to 10.0 ppm loadings; and in retaining fines as a wet-end additive at 0.1 to 0.5 pound per ton of paper.

ELIMINATES MANY OLD PROBLEMS—A synthetic of constant uniformity, Separan 2610 is effective over a wide pH and temperature range, is non-corrosive and presents no hazard in normal use. It also requires no preservative . . . and is especially easy to prepare and apply. A new disperser enables you to dissolve large amounts without a mechanical mixer! For a test sample and further technical data, write on your company letterhead to THE DOW CHEMICAL COMPANY, TECHNICAL SERVICE AND DEVELOPMENT, Dept. SC936G, Midland, Michigan.

you can depend on DOW CHEMICALS DOW

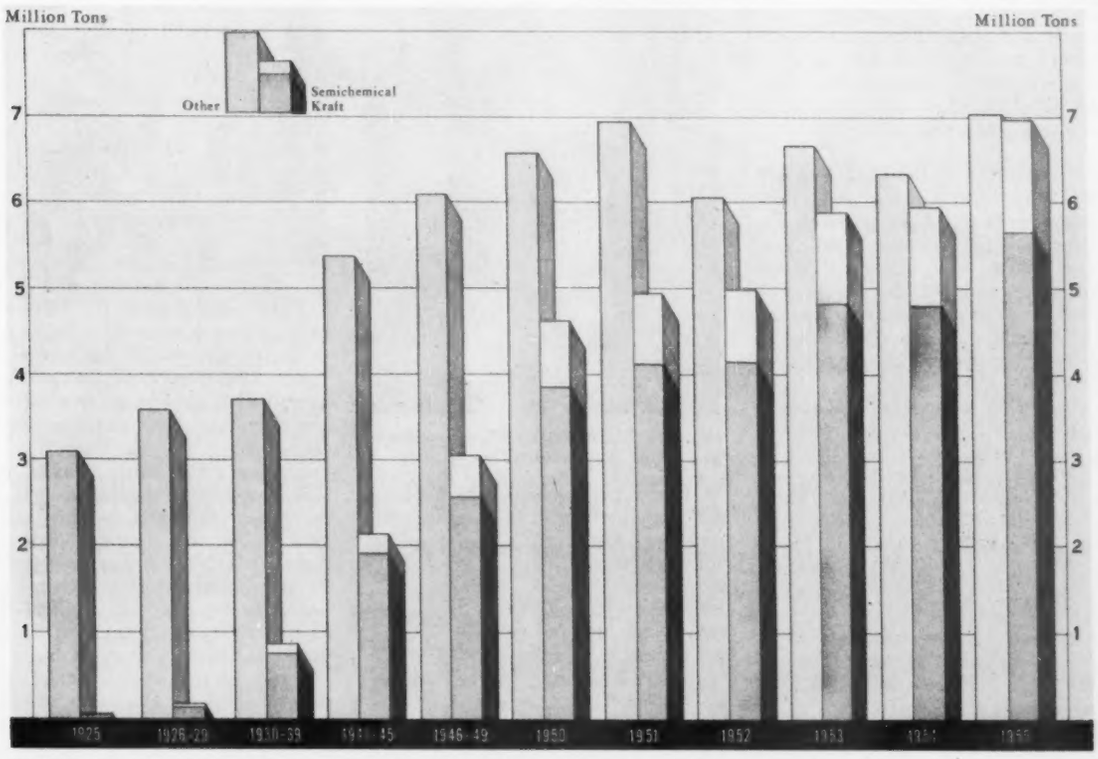
THE VANDERBILT LABORATORIES

Norwalk, Conn.

For Testing and Developing
Methods of Improving
Paper Products

R. T. VANDERBILT CO., INC.

230 Park Avenue, New York City



GRAPH SHOWS HOW 1955 PRODUCTION MEASURES UP. Paperboard, liners, jute and all other types except kraft and semi-chemical reached 7,122,300 tons last year. Kraft was close behind with 5,659,800 tons and semichem production was 1,329,200 tons. Graph by National Paperboard Assn., shows that kraft and semichem production together (in same columns) almost equal production of all other types of paperboard.

A SPECIAL PULP & PAPER REPORT:

Avoid Over-Expansion, NPA Warned

"Keep cool" meeting accents expansion threats. Rail car shortage; production predictions; paperboard problems

● The temperature outside the Hollywood Beach Hotel in Florida soared near the 100 mark one day last month but inside the hotel's Pageant Room the general atmosphere was strictly "keep cool."

The National Paperboard Association's 116 members were holding their spring meeting and despite statistics, reports and predictions that business was getting bigger and better all the time, there were overtones of caution. The theme of over-expansion in the industry drifted through several talks before Weyerhaeuser's Keve Larson stepped up and discussed it as a very definite threat.

The fact that the future looks pretty rosy for the paperboard industry was apparent from most of the association's reports. But there was, omnipresent, that qualification: "But."

And there were other problems to be faced, too. An acute rail car shortage was seen. General wage increases throughout the paper industry seemed a certainty. The dwindling national labor force was discussed. The possibility of a business dip during the summer was forecast.

Counterbalancing these thoughts were statistical wizard Al Newburg's charts and tables and his interpretation of them, indicating that this year would be the biggest yet for the industry, and the trend would continue. Business looks good. Competition is becoming more intense than ever and new paperboard products are appearing daily. The years ahead call for careful and wise planning by top management, said keynoter T. N. Bland, association president. "Long range projections of this country's economy are challenging," he stated. "Our industry can meet these future demands by preparation now."

"We have the makings of the most

spectacular labor shortage in the country's history," Mr. Bland went on. "There is a 40% increase in labor demand and about a 15% increase in the labor force estimated. It would appear that the only way the rapidly dwindling labor force can produce what we need is by automation. That and better development of managers, sales and production staffs."

PRODUCTION RUNNING AHEAD OF 1955 . . . Al Newburg, who performs most of the statistical magic for NPA, presented the association's statistics booklet for 1955 and then interpreted several of the charts and tables in it. He also brought up to date through the first 18 weeks of 1956, all production data contained in the book.

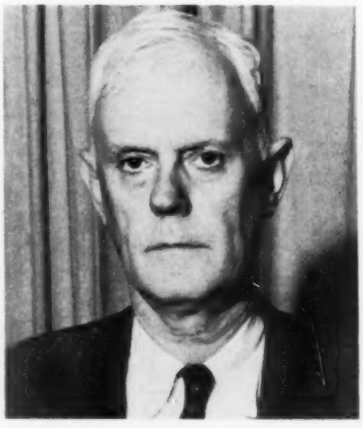
There were many significant trends apparent. Last year, for instance, total paperboard production was 14,011,300 tons, or about 4% below capacity of some 14,600,000 tons. Thus far in '56, mills have turned out 5,850,000 tons. Based on a full year, this indicates production of about 14,900,000 tons—about 1½% higher than last year's capacity.

Containerboard is up 12.7% over last year's production for the same period and liners are ahead of last year by about 12%. He estimated total containerboard production will be about 7.7 million tons in 1956, an increase of about 6% over last year's 7.3 million tons. Pointing out that the industry is constantly setting new production rates, Mr. Newburg told the group: "Our sights are now set on the 300,000 tons a week mark."

CRYSTAL BALL AND WHAT IT SHOWS . . . Once Al Newburg had disposed of the cold, hard facts, his partner in preparing the statistical data, Warren Wescott, took the podium to provide some precision predictions for thought. Mr. Wescott's figures were based on average per capita increase of 4.9 lbs. a year in paper use and Bureau of Census estimates of a population increase to 186 million by 1965.

Combined, these two sets of facts indicate that paperboard demand will probably be up to about 19.8 million tons by 1965, an increase of about 34% over last year's production. Based on present expansion programs within the industry and also assum-

Dr. Roos Sees Wage Boosts, Same Demand



DR. CHARLES ROOS—"Keep your eye on . . . the steel industry."

● The nation's paperboard industry can probably expect an increase rate of about 2½% a year in the future. So said Dr. Charles F. Roos, who heads up the Econometric Institute, Inc., 230 Park Ave., N.Y., and who made the "summing up" speech at the NPA's spring meeting.

Dr. Roos, onetime research director for the NRA, also forecast a general round of wage increases sparked by a quick labor agreement between the steel industry and its unions. Steel, said the white-haired economist, holds the key to general union-management talks throughout the U.S. With inventories low except in sheet steel, and heavy demands from the automobile industry expected, steel will be urged to settle its union contract without much bickering.

Dr. Roos also forecast a decline in capital goods orders through July and August followed by a general pickup in business. Federal Reserve's "tight money" policy has resulted in a general decline in capital goods demand not yet showing up in new orders. He also saw an "ominous note" in the gradual increase since last November of long-term interest rates in the face of steady new orders for consumers' goods. Money may "loosen up," however, and a steel wage increase will probably spark a general return to former levels.

As for paperboard demand, Dr. Roos predicted little change. On the basis that production for this year is now stable and that the first four months of 1956 has resulted in some 3% over-production, he predicted demand for the first half of 1957 will be pretty close to demand so far this year. "You should expect about a 3% increase in consumer demand," he said, "but since you have overproduced slightly for this year, they should average out. I would say that demand on the mills, that is, including inventory change, will be just about the same for the first half of 1957 as it was the first half of 1956."

NPA EXECUTIVES IN INFORMAL SHOT as they prepared to get informative spring session under way at Hollywood Beach Hotel in Fla. (L to r) MALCOLM K. WHYTE, Counsel, T. N. BLAND, Pres., A. W. LUHRS, Exec. Mgr., and HARRY ADLER, Secy.

LEADERS HAD A LOT TO TALK ABOUT following provocative NPA sessions. GEORGE E. DYKE, (left) Pres. of Robert Gair, Inc. and his associate N. F. GREENWAY (standing) talk with SIDNEY FROHMAN, Pres. of Hinde & Dauch Paper Co.

KEVE LARSON—"Over-expansion . . . a significant threat to the industry."

ing that, because of the demand, the 50% of the industry now averaging about a five-days week will go to six days, Mr. Wescott foresaw a boost in production to about 17.3 million tons by 1960. Demand will be about 17.9 million tons by then, he said. But he also added an extra 2 million production tons which he said would result from just normal, minor improvements during that period.

Result: There should be ample production to meet the estimated paperboard demand in the next four years if present expansion programs are carried out and no further new expansion is added, he said.

KEVE LARSON SOUNDS A WARNING . . . It was L. K. (Keve) Larson, sales manager, Pulp Division, Weyerhaeuser Timber Co., who actually warned that "the threat of over-expansion is one of the most significant in our industry today."

Quoting President Eisenhower's January comment that "over-expansion is one of the most insidious of all business excesses," Mr. Larson said the industry could expect substantial increases in the world's demand for market chemical pulp in 1957, with the full force of the demand hitting the industry by 1958.

The unresolved question: How far and how fast can producers go from today's production?

He estimated between half a million and a million tons increase in world demand for pulp by 1958. With U.S. production 12% ahead of last year, Canadian production up 7% over 1955 and new production records certain for this year, the outlook is good. There are only a few scattered evidences of excessive inventory. The big danger, he said, is that the industry may push too far and too fast to meet these new demands. Extreme care is called for because to be either too far-sighted or too short-sighted could lead to serious trouble, he said.

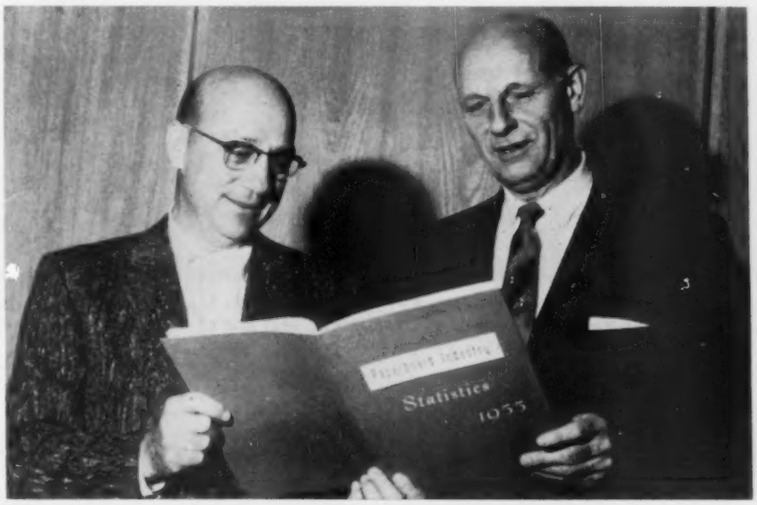
Mr. Larson said that demand for chemical woodpulp has increased about 95% since 1946—a total of 11.5 million tons. During the next two years, he added, the increase rate will be about 47% faster. Evidence that U.S. mills are rushing to meet these demands is shown by the fact that the amount of pulp scheduled to be in production by 1958 has jumped 700,000 tons since Jan. 1.

THOSE ELUSIVE RAIL CARS . . . Jim Friel is head of NPA's transportation committee. His report on the state of rail transportation was not a happy one. Plagued by a rail car shortage for the past 12 years, the industry will probably face an "acute" situation by the end of the summer, he said. The railroad industry's 2 million cars haul about 40 million loads a year, he revealed, but there are abuses to the rail system.

Shippers of some commodities load cars for shipment to eastern points with deliberate instructions to delay enroute until the loads can be sold.

Box cars, too, are frequently held up at ports awaiting ships, he pointed out. But the government is helping, said Mr. Friel. The ICC recently ordered no unnecessary delays enroute for freight trains. Violators will be fined. This may help. But one fact still remains—there just aren't enough freight cars to go around.

PULPWOOD OUTLOOK: GOOD . . . J. A. Auchter, vice president of Kieckhefer Container Co. and vice president and general mgr. of North Carolina Pulp Co., reported that Southern mills are now carrying from three to 14 days more pulpwood inventory than last year, and that there is apparently no problem yet in procurement, although there appears to be a short stumpage supply—producers can't get enough wood to be "complacent," he said.



STATISTICAL WIZARDRY was provided by AL NEWBURG, (left) statistician, who brought production data up to date, estimated biggest year yet, and WARREN WESCOTT (right), asst. statistician, who carried data further, looked into future, predicted "ample production to meet estimated demands."

NPA SCENES. JIM FRIEL (left) predicted "an acute rail car shortage by summer's end." At right, COL. WALTER P. SHORTER, V.P. of Camp Mfg. Co., in Florida garb, meets old friend C. R. WALKER, Pres. of Fox Paper Co.

LIKE BIG, SPOTLIGHTED SPIDERWEB. Here is what the big cranes at Bowaters underwater pond area look like during midnight operation, in picture by PULP & PAPER. At night, only one of the two Link-Belt gantry cranes operates. It can be seen hauling a load of longs in right center of picture behind glaring bright light.

How Successful Is Bowaters' Pond?

Results show yield is increased; loss in weight lowered; mullen and tear significantly lower after water storage

A New and Up-to-Date Report on a Famous Log Pond

PULP & PAPER published its first full description of the Bowaters Southern Paper Corp. $60,000,000 newsprint, kraft pulp and groundwood mill at Calhoun, Tenn., in the Jan. 1955 issue. Pictures and a description of the now-famous log pond were included in that story.

So much has been said about this log handling and log pond system since then, that PULP & PAPER decided to go back to Calhoun—to get a completely new story. This is a story of results of the first year and a half of operation. Also, in this story are first reports on some modifications and improvements. Also, as a valuable reference, here is a much more complete description of the whole establishment.

Why this revolutionary new way of handling and storing wood? It is an answer—admittedly high original investment—to the problem of storing wood in that hot and humid country and maintaining quality.

● The gigantic underwater storage pond for logs at Bowaters Southern Paper Corp. never ceases to attract—and amaze—even the most veteran of papermakers visiting the $60 million newsprint mill at Calhoun, Tenn. There are probably two reasons:

First, the aspect of seeing a man-made concrete and steel lake large enough to hold two million logs is enough to stagger anyone's imagination. Second, the daring innovation to log storage was viewed with skepti-cism by many pulpwood experts who felt that such a system would be impractical.

This 489-ft.-across pond is now a year-and-a-half old, time enough to show just how practical Manager K. O. Elderkin's idea was—and how successful it has been. The "Elderkin Wood System"—it can rightfully be called that since it is the product of Mr. Elderkin's foresight and ingenuity—has served its purpose well and measured up to Mr. Elderkin's dreams.

Before considering results, however, it is perhaps just as important to study how the log storage pond operates.

WHY WAS UNDERWATER STORAGE DEVELOPED? . . . One of major headaches of the Southern woodyard manager is the rapid decay of Southern pine during hot summer months. Safe storage periods are limited to such an extent that during the hottest of the blistering summer months, a Southern paper mill cannot keep an adequate stockpile of wood on hand without experiencing major loss through decay. It is a little known but well established fact that this decay stops when wood is stored underwater.

In order to take advantage of the summer months—when wood can be readily obtained—K. O. Elderkin, while manager of the Crossett Paper Mills at Crossett, Ark., started experiments in his underwater storage idea. Unlike some northern woods, Southern pine readily becomes waterlogged and sinks.

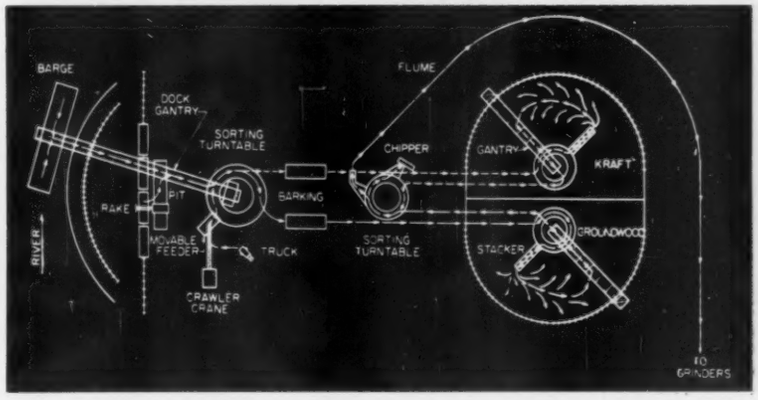
It was determined after initial experiments that underwater storage would accomplish two objectives. First, it would prevent decay and second, watersoaked wood has a practically constant moisture content. The engineering department at Crossett, working closely with Mr. Elderkin, therefore went ahead and designed a model pond to determine the feasibility of such an idea and the equipment necessary to operate it. Basic designs for the finished pond at Bowaters were completed by engineering consultant Willie Saint-Laurent, of Montreal, Canada, and the J. E. Sirrine Co., Engineers, of Greenville, S.C.

When Mr. Elderkin joined the Bowaters organization, he saw his theory become the focal point in the design of the new mill. The pond, 489 ft. in diameter at the outside rim, 380 ft. across at the bottom, holding enough water to float a 10,000 ton ship, became part of Bowaters new mill.

The novel method of storage has accomplished several objectives. Yield is increased in preparing paper from logs of uniformly high moisture content; procurement is now better regulated to fit seasonal labor and weather changes; the fire hazard present in the normal pile of drying wood is minimized.

PLENTY OF ACTION HERE. Picture taken near barge unloading point shows all three Bowaters unloading devices in action at one time. In foreground, Lorain rake clears flatcar, behind it, Lorain crawler empties trough where logs are swept. At left, gantry crane carries load from river barges toward debarkers.

HOW THE POND OPERATES . . . Bowaters gets wood from three sources: by rail, by truck, and by barge up the Hiwassee River. Since about a third of the wood comes by water, it was necessary to design unloading equipment so it would reach out over the water. One of the outstanding features of the pond system is this unloader, designed and built by Link-Belt Co. A cantilever gantry crane, 248 ft. overall, travels in a 62° arc along a curved track adjacent to



HOW UNDERWATER LOG POND WORKS. Diagram by Bowaters' engineering staff shows how the Link-Belt constructed pond system works. River is at left, pond and gantry cranes at right.

the river bank. It pivots in a 154 ft. radius. Thus the crane not only reaches out about 75 ft. over the river, but can traverse a considerable distance along the bank, picking up wood loads from either barges or railroad cars. Normally operating with an orange-peel grapple, the crane can be equipped with a hook for handling log slings.

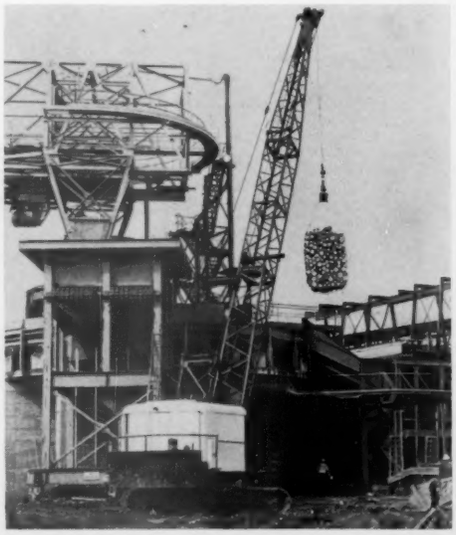
A Lorain TL-8205 crawler is used to speed-up unloading of trucks and a Lorain rake scrapes logs from flat-cars into a ditch along the edge of the railroad tracks where they are out of the way until the grapple can scoop them out and transport them to the barking system.

All pulpwood is discharged onto a heavy-duty Link-Belt chain feeder located at the pivot point of the crane. From there it is delivered to a 60-ft. turntable conveyor. The 7-ft. wide conveyor distributes logs to one of three debarking drums. Since both kraftwood and groundwood are stored in the pond, a division of the two wood types is made at this point. Each of the outside debarking drums distributes wood to its own system—one for sulfate, the other for groundwood. The center debarker can throw the wood either way. From here, the separated wood is carried to the center of the big pond by 400-ft. parallel cable conveyors where it is dropped on turntables and twin Link-Belt rotating stackers shoot it out into the water. The pond is divided in the center, with duplicate equipment designed to get wood out of both the side for groundwood storage and the sulfate side.

THOSE BIG GANTRYS AT THE POND . . . Gantry cranes, supplied by Link-Belt and designed to be fully automatic, are used to remove logs

WOOD IS UNLOADED

In picture at left, Lorain crawler empties truck and dumps logs into conveyor hopper. At right, logs are swept out onto rotating conveyor by Link-Belt chain feeder, then delivered to debarkers for sorting as groundwood and kraftwood before bark is removed.



LOGS AWAY. Giant Link-Belt gantry crane, designed for fully automatic operation if necessary, drops payload of two cords of wood into hopper where it will be fed to grinders in mill. Picture by PULP & PAPER, taken from edge of hopper.

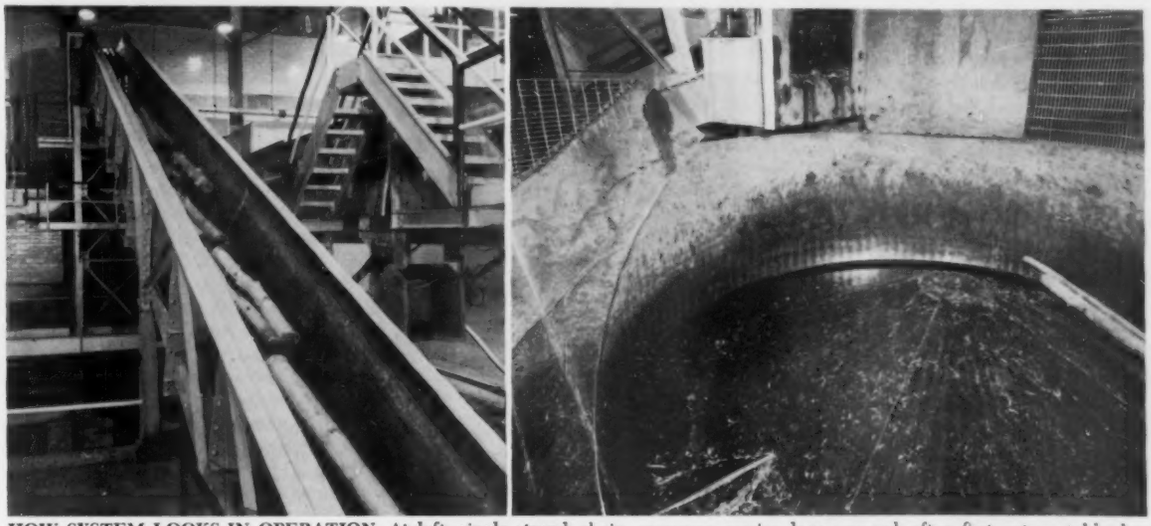
COMING AND GOING. Logs are carried by Westinghouse-driven cable conveyor from debarking drums to the pond and then back into woodroom for either transport to mill or to Carthage chipper and storage in silos.

from the pond. The two big cranes pivot from the island in the center of the lake, with outside legs traveling a complete 180° arc along the outside rim of the storage area. Normally operated by man, these cranes have been designed for completely automatic operation. Logs can be picked up at any point in the pond, hoisted to a maximum 65 ft. and can be delivered up to 180 ft. to the pond island. The close motor for the hoist is 100 hp and the hold motor is 40 hp, operating through Link-Belt D-180 D-110 double reductive parallel shaft gear drives. (*Turn to next page*)

GROUNDWOOD SEPARATED FROM KRAFT

On rotary conveyor, wood for kraft is circulated before going to chippers. Laborer here is pulling off stray logs for groundwood by ax, dropping it into chute in foreground for delivery to flume.

FLUME CARRIES GROUNDWOOD DIRECTLY TO MILL. (Left) Log splashes into flume as it rides out chute from woodroom. Logs then float in flume around the perimeter of the pond and empty onto a Link-Belt two-strand jackladder in basement of mill. At right, are logs as they reach end of underground portion of flume and begin journey up reversible system. PULP & PAPER editor hung camera down in flume chute on end of a string, with cable release, for this picture.



HOW SYSTEM LOOKS IN OPERATION. At left, single strand chain conveyor carries logs upward after first rotary table has changed direction. Second rotary table can be seen at top, apron conveyor at right. At right, closeup shows how the second table swings wood 90° before dropping it on apron.

The big grapples, hauling upwards of five tons of logs, drop them into receiving hoppers with 18-strand Link-Belt C-124 chain feeders which deliver the wood to the same turntables that feed the stackers. The turntables, traveling in the opposite direction, drop logs into the cable conveyor for delivery back to the preparation room. This turntable performs a three-fold duty; it delivers wood to the stackers as it comes out to the pond, it sends kraft wood to the chippers and delivers groundwood to the flume which carries it to the mill. Sulfate wood is chipped by a single Carthage unit, screened over Orville-Simpson Rotex equipment and then carried to one of four Stebbins lined chip silos for storage until they are carried by conveyor to a tripper over the digesters.

UNIQUE GROUNDWOOD DELIVERY SYSTEM . . . Groundwood logs float around the perimeter of the pond in a flume and are delivered to a Link-Belt jackladder deep inside the mill. This is a new system since the pond was designed. It utilizes two novel rotary table transfers and is highly effective in reversing the direction of the wood twice before delivering it to the grinding room as well as positioning logs properly for pickup by the next conveyor without jamming.

The first switch removes logs from the two-strand jackladder and whirls them around so they are discharged at 180° on to a second inclined conveyor. A similar table at the top spins them 90° and shoots them onto the slow-moving apron conveyor from which they are put to the grinders. The wood is actually delivered to the aprons over the same spot that it leaves the flume two stories below.

The original pond system has been in operation now since July, 1954. In one week, one man loaded 7,185 cords of wood with the grapple system. To date, the record for a one-week operation is 29,000 cords delivered to and from the wood room.

WHAT ARE THE RESULTS . . . Since the inception of underwater wood storage at both Crossett and Bowaters, laboratory studies have been continually performed to determine the effectiveness of the ponds. K. O. Elderkin, commenting on the storage idea, told PULP & PAPER:

"We are convinced that the ponds are doing exactly what was expected of them. We are well pleased with the results."

Previous to construction of the underwater log ponds, lab studies on yard-stored Southern pine pulpwood have shown that the yield of kraft pulp on an oven-dry wood basis is decreased about 3% in six months storage during summer months. Further tests have also shown that yard stored wood will lose upwards of 7% of its weight because of deterioration during that same six months period. This means an overall loss of about six pounds of pulp per 100 pounds during those six months. The remaining wood is significantly lower in both mullen and tear than green wood. It can be reduced by as much as 25% during six months summer storage.

At Bowaters, wood has been stored in periods up to one year with no loss in yield or pulp quality detected in the lab studies. And, while the initial cost of the installation was high, savings have been realized at Bowaters in both manpower and in wood savings during the months when deterioration ordinarily would have taken its toll.

Through this novel storage idea, Bowaters has shown many skeptics that storing pulpwood under water is a worthwhile venture, despite the high initial cost of the pond. The significant thing accomplished here and at Crossett, however, is to provide the industry in the South with at least one answer to the question of how wood can be purchased during periods of plenty and stored without loss in quality. Whether others will follow this same concept remains to be seen.

END OF THE LINE FOR GROUNDWOOD. Apron conveyor transports wood to any of nine Great Northern grinders. Water is screened by Link-Belt screen, which removes bark, wood and other debris.

Engineers are Promoted

J. S. GOULDING (left) has been promoted by Powell River Co. to Project Engineer for the sulfite mill, responsible for engineering in connection with mill modifications. ALBERT C. MULLEN (right) has been appointed Assistant Plant Engineer. Since last Summer he has been Project Engineer on construction of No. 9 paper machine and a finishing room.

6% Wage Boost Agreed for West Coast

A two-week wage conference at Portland, Ore., in May terminated in agreement on a one-year contract calling for an average across the board wage increase of 6% for the industry's men and women workers in 41 mills in Pacific Coast states.

This is equivalent to an average 12.3 cents per hour increase and establishes a base rate of $1.94 per hour for men, $1.64½ for women. Other contract changes include a fourth week of vacation for employes with 25 years service and upward adjustments in medical coverage.

Results were submitted to a referendum of 51 local unions for approval.

AT FIRST MEETING OF EAST TEXAS PULP & PAPER CO. NEW DIRECTORS AND OFFICERS were (l to r, front row) RICHARD A. McDONALD, Chairman of Executive Committee; CHARLES E. STILLMAN, Chairman of Board; R. M. "MIKE" BUCKLEY, President; (back row, l to r) WILLIAM J. CARTER, Director; WILLIAM E. MERREM, Vice Pres.; ARNOLD CARLSON, Director; ARTEMUS GATES, Director; ROY E. LARSEN, President of Time Inc. and a Director of East Texas; and DAVID W. BRUMBAUGH, Vice Pres. Photo by PULP & PAPER.

New Leadership for East Texas Co.

• A significant turning point in the affairs of 3½-year-old East Texas Pulp & Paper Co. began on June 11 when a completely reorganized company, now wholly owned by Time Inc., took over the helm.

Charles L. Stillman, 52-year-old native New Yorker, who also is in overall charge of financial affairs and production of Time, Life, Fortune, Architectural Forum, House and Home, and Sports Illustrated, became chairman of the board of East Texas.

R. M. (Mike) Buckley was promoted from executive vice president to president. Native of Everett, Wash., a University of Washington graduate, he had been vice president and sales manager of Soundview Pulp Co., now a Scott subsidiary, before joining East Texas.

These two, along with David W. Brumbaugh, Arnold W. Carlson, W. J. Carter, Artemus L. Gates, Roy E. Larsen, Richard A. McDonald and W. E. Merrem, compose the new board of directors, which met for the first time in New York City on June 11. Just five days earlier, the financial transaction was completed which ended the partnership of Time and Houston Oil Co. in the pulp and paper enterprise.

Richard A. McDonald, the Californian who spearheaded the original planning and organization of East Texas, is chairman of a 5-man executive committee. He is a former top officer of Crown Zellerbach. The other executive committeemen are Mr. Stillman, Mr. Buckley, Mr. Larsen, who is president of Time Inc., and Mr. Brumbaugh, vice president and secretary of Time.

GAINS VAST RESOURCES . . . Time not only gained Houston Oil's former half ownership, but also the full ownership of an old and rich Houston Oil subsidiary, Southwestern Settlement and Development Corp., holders of 660,000 acres of attractive "perpetual-yield" Texas timberlands and other assets, which of course include potential oil wealth.

Henry Kaiser and others have at times in past years been interested in Evadale, Tex., for a paper mill. Original application for a government certificate for the mill at Evadale was made by Time, Houston Oil and Scott Paper Co. in May 1951. But Scott withdrew when it closed its stock exchange deal in Dec. 1951 to take over Soundview in Everett, Wash., largest sulfite pulp mill in the world, and vast forest resources in the Far West.

Breaking ground in the spring of 1952, the Time-Houston Oil partners had their new mill in production by Dec. 1954. It is now rated at 300 tons a day of bleached food or paperboard, which can be coated, or 300 tons of chlorine dioxide bleached kraft market pulp, both made on a 216 in. Beloit Fourdrinier. No change in manufacturing or operating policies is contemplated.

Under the partnership, the program had been for Mr. Stillman and Harold Decker, president of Houston Oil, to alternate annually as presidents of East Texas.

OTHER OFFICERS . . . In the new organization, other new officers are:

Mr. Brumbaugh, who joined Time as head of accounting two years out of Harvard Business School in 1933, is vice president.

Albert G. (Buff) Natwick, vice president. He is also resident manager. A Wisconsinite, he was a Crown Z executive for many years at Camas, Wash.

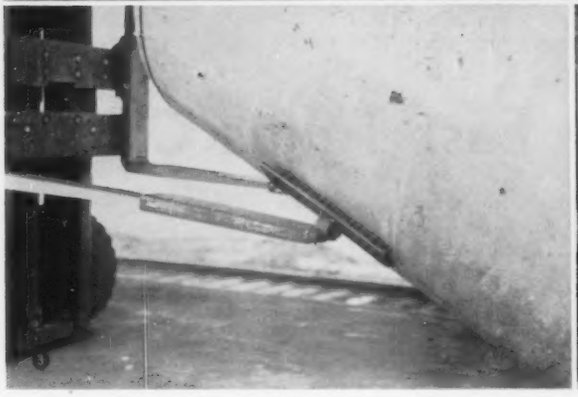
Clarke H. Morian, Jr., vice president. He has headed sales since the mill started and had long experience in industry sales.

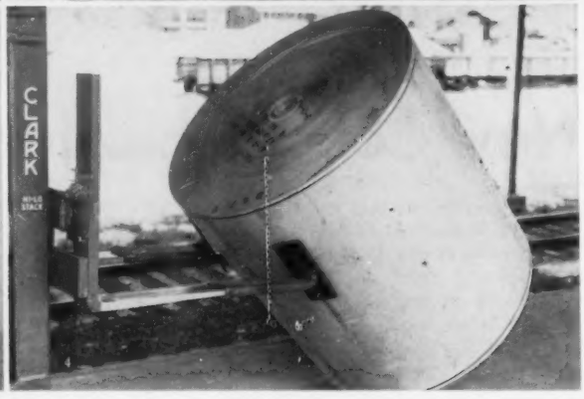
Mr. Merrem, vice president. Also a director, he is general manager of Southwestern Settlement and Development Corp., now an East Texas division, and has moved his headquarters from Houston to Jasper, Tex., to be nearer the timber properties and the mill.

C. E. Cole is secretary and treasurer in the new organization. Mr. Brumbaugh and Mr. Carlson, comptroller and assistant secretary of Time Inc., are assistant secretaries of East Texas.

Some experienced financial people are of the opinion that as years go on, this East Texas Company may prove a most important asset of Time Inc., in some respects as great as its famed magazines.

How To Do It





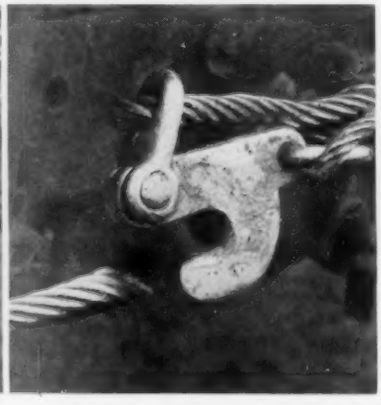
Easily Made "Shoes" Simplify Roll Upending

A simple and easy-to-make "shoe" which slips over the prongs on a lift truck is being used at National Container Corp's Valdosta mill to flip paper rolls into an upright position.

The attachment was built in the mill machine shop and is flawless, according to the men who use it. These "shoes" are flat, iron tubes which fit snugly over the lift truck prongs. On the end, a flat, tapered piece is attached by means of a swivel which enables this piece to swing freely at the end of the prongs.

The flat pieces are attached so that they angle slightly toward each other. (Fig. 1) They are tapered at the edges to prevent tearing the paper as they slide under the roll. In operation, the lift truck prongs are simply lowered to the floor and the flat pieces swing down until they are parallel with the prongs. The prongs are then pushed under the roll and raised. (Fig. 2) The flat pieces revolve on the swivels so they are always flat against the roll, (Fig. 3) thus sliding easily up its side and flipping it to an upright position (Fig. 4.)

When not in use, the shoes can be easily removed and stored.

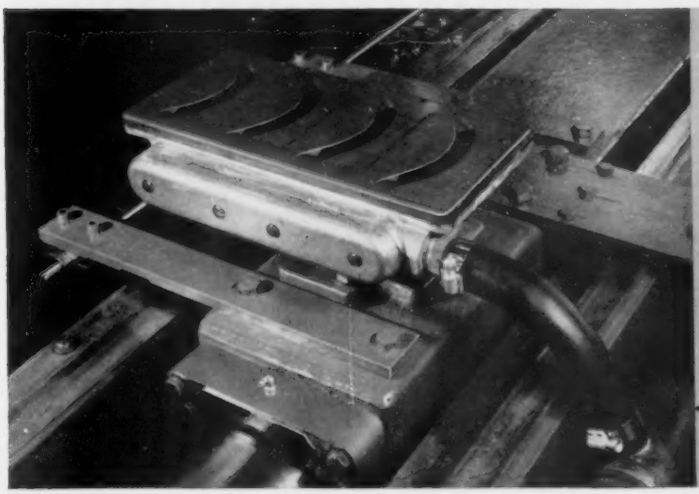


How West Virginia Uses Release Device in Slings

These two pictures show how West Virginia Pulp and Paper Co. uses quick release device in slings to speed up loading and unloading. Clamp is pulled under load and cable, at left, is hooked over it (as in picture at left). Weight of the load merely tightens the grip of clamp over wire. When load is delivered, crane or fork lift truck operator pulls cable release which draws the top wire on right back and slips right off (as in picture at right). All West Virginia trucks and cranes are equipped with this simple sling device.

Run at Top Speed Right through the Week by VICKERY CONDITIONING your FELTS

You won't have to stop your paper machine during the week to unclog your press felts when they're equipped with Vickery Felt Conditioners. This low-cost protection against high-cost shutdowns also results in lower drying costs, improved uniformity of finish and, in many cases, increased felt life.



CONDITION WET FELTS, TOO

With the new Vickery Wet Felt Conditioner you can keep cylinder machine top and bottom felts continuously open and clean. What's more, you can do it *without showers, without whippers.*

One of the conditioning boxes on the Vickery Wet Felt Conditioner.

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SOUTH STABILIZES WOOD FLOW . . . Concentration yards like this typical small yard in Southern Alabama have enabled paper companies to keep constant wood supply moving into mill. Complete mechanization of these yards, with lift trucks like this Hyster, speeds delivery of the wood, keeps producer moving and happy.

SOUTHERN PROBLEM: LABOR SUPPLY . . . Negro rural labor, long the mainstay of cheap forest work, is moving to the city and the North. Trend to more effective use of machinery, like this McCulloch chain saw, may help solve problem.

New Trends Are Gaining Momentum

South fights fires and flight of labor—Far West tries portable chippers—other U.S., Canada developments

● Contrasts and similarities will be found in pulpwood production practices in the different areas of North America. The trend toward use of sawmill chips and veneer chips for pulp mills started on the West Coast and has spread rapidly there. But it likewise has been taken up in the South and promises to become a major source of supply there. Use of pallets for easy, efficient movement of logs out of woods and use of light mobile equipment spread in the South, and is now being adopted elsewhere. A "must" in the Far West for more efficient logging salvage and for smaller species is light equipment such as other regions have been using. And so it goes.

In this article, some highlights of recent trends are reviewed, by areas: In the South, the Northeast, the Middle West and Pacific Coast of the United States, also in Western Canada and Eastern Canada. In each area, practices vary, to meet local requirements or conditions.

RECORD PRODUCTION . . . In the United States, pulpwood production had reached a record high of 30,894,000 cords in 1955, up nearly 4,000,000 from 1954. This compares to less than 5,000,000 cords in 1920 and only 12,400,000 cords in 1940. And yet with all this increase, it is axiomatic for all major companies now to have adequate future yields and supplies assured. In fact, by 1975, consumption of 50,000,000 cords annually by the U.S.A. is forecast.

Canada produced about one-third as much pulpwood last year as the U.S.A., and American imports of Canadian wood brought total consumption in U.S.A. to a record consumption of 33,332,000 cords. This compared with 29,436,000 in 1954 and only 17,818,000 cords ten years ago. The trend so far this year shows production and consumption up about 12% to 15% and probably will be maintained generally through 1956 at that pace.

The South was the big 1955 producer in the U.S.—18,700,000 cords, compared to 9,200,000 cords in 1947, and 5,900,000 in 1940. The Pacific Coast region was second in 1955, with 5,933,000 cords. The biggest increases are foreseen in these two areas in future years. But the Stanford Research Institute's forecast of a 15,500,000-cord increase in the South and 4,700,000-cord increase in the Far West by 1975 (over 1952 figures), already seems to be much too conservative, as revealed in expansion plans which have developed since the

report was issued in Sept. 1954.

Close to 40% of Canadian pulpwood production is from the Province of Quebec, but the big future expansion in Canada is going to be in British Columbia and Alberta, as major future projects already show.

THE SOUTH:

MECHANIZATION, UTILIZATION, REFORESTATION . . . The trend toward more complete woods mechanization, which gathered steam last year, became even more characteristic of the Dixie picture in 1956.

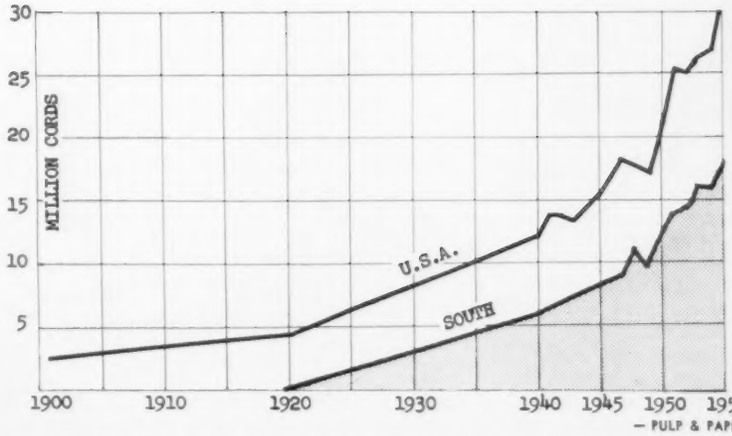
Pulpwood producers and pulp mills had to face up to two hard facts: the rural Negro worker, long a source of cheap labor in the South, is migrating North or to the city, putting the worker on a premium basis; the minimum wage boost is raising labor cost even higher. Result: woodlands managers are concentrating more than ever before on machinery which will cut down manpower.

Rural population is now down to about 8 million and still draining off. The Negro population today is greater in Illinois, for instance, than in the state of South Carolina, which is fast becoming one of the most competitive pulpwood areas in Dixie. The picture is further complicated by the increase in the use of wood. Original estimates for 1956 have been raised sharply to 21 million cords—2½ million more than last year.

THAT SAWMILL CHIP . . . One method for attacking this problem is the increasing use of chippers in Southern sawmills. Most large sawmills are now going to full utilization of waste by chipping. Several chipper manufacturers are selling more big equipment to the large Southern sawmills, and companies like Jackson Industries, of Birmingham, Ala., are now producing economical chippers designed for use in small mobile sawmills.

The South is now using more than 300,000 cords of sawmill chips a year, enough to keep a 400-ton paper mill operating. According to APA's Southern logging engineer, Jim Holekamp, the South will eventually be using 2½ million cords of pine chips from sawmill waste—or the equivalent of planting 83,000 acres of trees every year for the next 30 years.

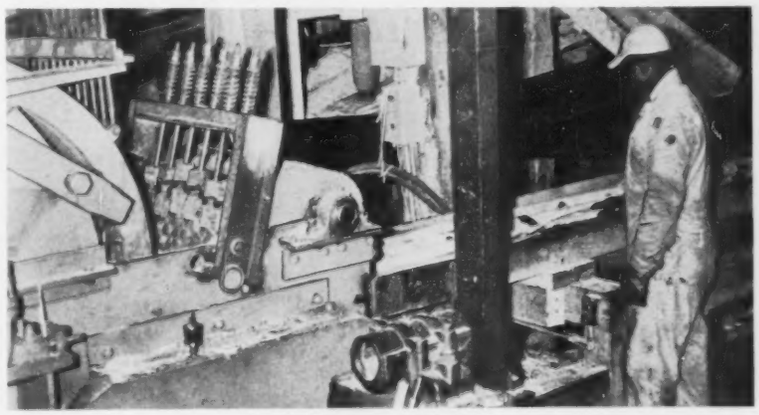
INTEGRATION GENERATES INTEREST . . . Tied in with this is the apparently increasing interest of large paper companies in sawmill-pulpmill integration. It is already working very economically in mills like those of Crossett Co.'s and Camp Manufacturing Co. Olin Mathieson Chemical Corp., recent purchasers of the Brown Paper Mills in West Monroe, La., has two sawmills strategically located in its sprawling timberlands in Louisiana, Arkansas and east Texas. One, the Huttig, Ark., mill, has recently been expanded into one of the most progressive sawmills in the South. It provides chips for the West Monroe mill. The second sawmill, at Winfield, La., which Olin Mathieson purchased from Southern Advance Paper & Bag, will also be expanded to match the Huttig mill. This type of integration provides a means of more fully utilizing all the possible wood cut.



PULPWOOD PRODUCTION GROWTH—in U.S.A. and Southern States.

MORE AND MORE CONCENTRATION YARDS . . . The concentration yard has also come into its own in the past year. Pioneered by progressive companies like West Virginia Pulp and Paper Co. (see PULP & PAPER, June 1956 issue), these concentration points along rail sidings are becoming more and more evident. In south Georgia, it is not uncommon to find counties providing their own concentration yards to stimulate more business and assist paper companies in stabilizing the flow of pulpwood to their woodyards. The yards are fully mechanized, using Hyster and Ross lift trucks to quickly shift cords from pulpwood trucks to rail cars. Most paper companies in the coastal plains and eastern Southern states have now set up concentration yards in their woodlands and in areas where they purchase large supplies of pulpwood from private producers.

ANOTHER SIGNIFICANT DEVELOPMENT . . . Typical of the trend to use of hardwoods in the South this year was the startup of Crossett Paper Co.'s new food container mill at Crossett, Ark. The new mill uses a combination of sulfate and sulfite and will enable the company to use small hardwoods previously unsuitable for its sawmill. If the mill is a success, other companies may follow suit and small hardwoods, formerly girdled and left to die on the stump, may come into their own.



MORE WASTE UTILIZED IN SOUTH—This new Filer & Stowell Co. chipper now operating in L. R. Foreman and Sons Lumber Co. in Elizabeth City, N.C., is typical of many types used in the swing to more complete utilization of waste wood in large and small sawmills throughout Dixie. Estimated cords from sawmill chips this year: 300,000 cords, enough to keep 450-ton mill operating.

PULP & PAPER PULPWOOD SECTION

THE VANISHING MULE . . . Through the help of paper companies, more pulpwood producers in the South today are swinging away from the "two mules and a wagon" method of getting pulpwood out of the forest and are purchasing tractors of the International TD9 class, Olivers, Caterpillars, etc., to haul their ingenious pulpwood pallets. Chain saws are increasingly popular—it is hard to find a producer anymore who does not consider his chain saws one of his most important pieces of equipment. This woods mechanization, while not reducing the number of necessary laborers, is increasing to a sizable degree the cords per man/day produced in Southern forests.

QUEST FOR THE "SUPER" TREE . . . Reforestation and conservation practices, too, are being "souped up" this year of 1956. No longer satisfied with merely perpetuating their wood supplies, many paper companies have entered into cooperative programs of genetics aimed at producing near-perfect seed trees. In Florida, nine paper companies have already started such a program in cooperation with geneticists at the Univ. of Florida. Other companies are working with colleges in North Carolina, Texas and Mississippi on similar programs. Progressive forest commissions like the state of Georgia's are constantly working to upgrade the quality of seedlings.

The problem of forest fires (85% of them in the South) has finally been tackled in earnest and efforts are on hand now to strengthen arson laws and cooperative fire fighting plans. In 1954, the value of Southern forest products was $5,151,000,000. If the fire problem can be licked, this figure could soar to $15 billion by 1975.

Prediction: This year will be an increasingly important one in the fields of equipment and supplies, hardwood use and genetics.

BARKER ON BARGE IN FAR WEST . . . Nicholson Rotobarker at C. D. Johnson Lumber Co., division of Georgia-Pacific now building pulp-paper-paperboard plant near Toledo, Ore., where PULP & PAPER took this photo. Barkfree logs from barker return to pond, then go to sawmill or plywood plant for highest utilization.

PACIFIC COAST:

TRIES OUT PORTABLE CHIPPERS . . . During the past year portable chipping in the woods highlighted new innovations introduced into pulpwood activities of the Pacific Coast section of U.S.A. Although none are known to be in operation except on experimental, trial-run proving basis, portable barkers (or portable barker-chipper combinations) are receiving wide consideration as an economical means to recover more usable wood.

Stationary barkers installed in conjunction with processing plants, particularly sawmills and veneer-plywood plants, continue to assume increasing significance to the pulp field as well as to the industries using them. The volume of lumber and veneer by-product wood converted to pulp chips has consistently assumed larger proportions for several years in Oregon and Washington. The past year is no exception. In fact, the wood-recovery processes of these industries assume even more significance than ever before to the pulp manufacturers.

That producers of solid wood products are tending to convert from single product operation to integrated plants means that higher investments for furthering wood utilization thus becomes practical and logically follow. Furthermore the objective of "using the tree for its highest utilization" seems to be spreading to include all sorts of forest products industries.

MORE CHIP SOURCES . . . Plants at which lumber has previously been the sole product are adding veneer production facilities. To the pulp chip buyers this compounding expansion means additional market chips.

Some of the integrating operators not only installed chipper, but barkers, too. In such cases—and these are not confined just to the "large operations"—all logs arriving at the plant are debarked and then converted to their highest utility as far as the available production facilities are concerned. Peeler logs characteristically go into veneer, sawmill logs into lumber and logs that are more valuable for sale as pulp chips go to the chipper.

Such arrangement makes for considerable increase in chips produced—even where the plant receives only the same type of logs as previously. Besides, it offers new horizons for the economic utilization of forest wood which previously would not pay its way.

The practice of pre-logging, thinning, and re-logging of private forest lands for the dual purpose of (a) higher wood utilization and (b) better forest management, continues to get more converts. The utilization of marginal logs has increased at mills making pulp chips, particularly where

LIGHTER LOADS, SMALLER TRACTORS IN FAR WEST . . . International Harvester TD-9 tractor is mounted with a Drott Skid Grapple in this Washington State woodyard. Small, wheel tractors are also being used extensively in this area.

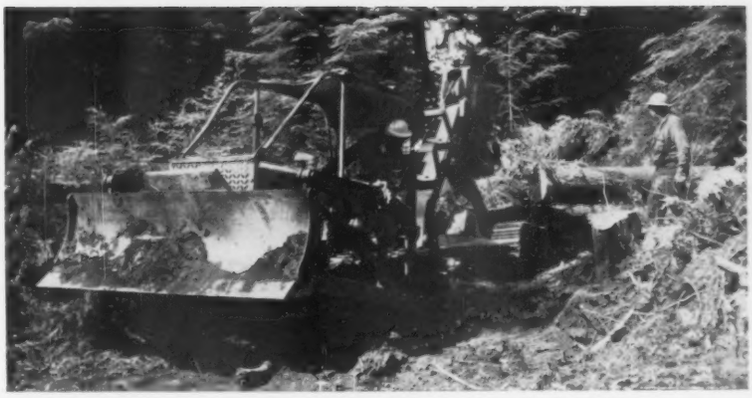
processing facilities are integrated product-wise and include barkers and chippers.

IMPROVED HANDLING . . . These various means of obtaining closer utilization of wood are being assisted by improvements in handling and transport equipment. Portable yarding towers and loaders with air tongs are examples of machinery adaptations befitting the small-timber logger in the Douglas fir region.

Rubber tired logging equipment appears to be receiving general logger acceptance more rapidly to the east of Cascade Range summit than to the west. Two prime factors for this are that the fir belt has higher per-acre volume and greater precipitation than does the pine belt.

Another recent development providing beneficial impact on forest economics—and, of course, on forest utilization and management—is the new king-size crawler tractor. Operators using these mechanical behemoths express enthusiasm over the additional power, stamina and other changes for road building. Their use reportedly reduces construction costs appreciably in areas to which they are adaptable. The increased weight and "muscle" enables these tractors to more readily perform heavier tasks in a routine manner. Resultant effects include efficiencies such as lower powder costs, less maintenance expense and more rapid road construction.

Compacting the roadbed as an integral factor of construction further reduces road construction costs. It makes for less ballast to produce a road of given quality. Roads hold prime importance throughout the Western logging region. They are esssential to forest harvesting and subsequent management and protection, but are expensive to build and still present maintenance cost problems.



WOODS MECHANIZATION INCREASES IN LAKE STATES. Here is a typical scene of midwestern operation taken in northern Wisconsin. Oliver OC-12 equipped with twin ram dozer and winch is used mainly for skidding and grading new roads.

MIDDLE WEST:

SWING TO HARDWOODS INCREASES . . . The swing to hardwoods in the Middle West of the United States is the most significant development in pulpwood production for that area of the country. Also, more "hard" hardwoods are being used.

Production of hardwood pulpwood in the major producing states—Minnesota, Wisconsin and Michigan—reached 1,245,000 cords in 1955, compared to 1,134,000 in 1954 and only 762,000 cords in 1950. It is now over half the total of all species produced for pulp. The 1955 total of all species was 2,404,000 cords, the second biggest year in Lake States pulpwood logging. In 1951, 2,577,000 cords were produced, including 1,044,000 cords of hardwoods.

Three new mills in Northern Michigan for hardboard or softboard are based on use of hardwoods, a printing paper mill in lower Michigan goes over to hardwood supply, others in south Michigan are doubling or greatly increasing hardwood usage.

OHIO GETS INTO THE ACT . . . This Lyneholme Tree Farm sign approved by the Ohio Forestry Assn. and Ohio Division of Forestry, Wooster, O., shows a landmark of a profitable private producer. Iowa and Illinois dedicated their first private industry-sponsored Tree Farms in 1955.

Illinois and Iowa dedicated their first tree farms last year. In Iowa, another strawboard mill bit the dust; was revived by changing over to hardwoods. In Wisconsin, Ohio and Minnesota more hardwoods are used, and this is the sole basis for expansion of major companies. Not only the favorite aspen, but oak, maple, beech and birch are used. One Wisconsin kraft mill is even using elm. Improved processes make this possible and keep quality of product high.

NEW BARKERS . . . Tied in with this trend to hardwoods are new developments in barking. The Swedish-developed Cambio barker and the Impco mechanical barker are proving popular and there is a growing interest in chemical debarking by treatment of trees in the woods. An Anderson debarker at L'Anse, Mich., is a big producer for Marathon. More and more wheeled tractors are being used.

Five Soderhamn Machine Co. Cambio barkers have been ordered for Lake States mills, as an answer to their needs for soft hardwoods, like "poppel" (aspen), and for the hard hardwoods, too. These will be used on aspen for the big expansion at American Box Board Co., to supplement hydraulic barking already in use.

NEW TYPE CHEMICAL DEBARKER . . . As for chemical debarking, American Chemical Paint Co., of St. Paul, Minn., is experimenting on a hormone type chemical which is not toxic, and will be applied in a spray type method on outer bark of hardwoods. No girdling will be necessary with this new chemical, according to reports, and it is said to have so far proved 100% effective with aspen. In varying degrees, it has succeeded with other hardwoods.

WHEEL TRACTORS . . . Mechanization is the theme for all wood pro-

duction of the Middle West mills. There is a definite trend toward lighter loaders mounted on smaller, less expensive wheel tractors. These include International Harvester, Oliver and Ford wheeled tractors. The light equipment is of more importance, of course, to the small operators and independent producers than for the big companies.

FORESTRY TRENDS . . . Reforestation is going at full pace in the Midwest. Much jackpine and red pine and even spruce is being planted. Woodlands managers in Wisconsin say their state will be almost entirely independent of out-of-state imported wood as aspen and pine use increases, along with other home grown hardwoods. All they will need to import are the small amounts of spruce needed for particular grades. Michigan has made an amazing comeback as a wood producing state, thanks to its fast growing hardwood forests.

Several Midwest companies are engaging "extension foresters" who are on the payroll of the pulp and paper companies but are serving local woodland owners entirely, especially the independent suppliers in a position to supply mills with both coniferous and deciduous types of pulpwood.

Big things are expected of the relatively new studies on forest genetics at the Institute of Paper Chemistry, Appleton, Wis. It is focusing upon polyploid production of trees, so far employed very little in America as compared with Europe. Cross-breeding and selection methods are expected to be the key to much faster growing trees with superior pulp and paper qualities. Univ. of Minnesota is also conducting research in forest genetics.

THE NORTHEAST:

PLENTY OF WOOD IN EAST . . . There's a tremendous untapped potential of wood in the East. "Make no mistake about it," one pulpwood manager told PULP & PAPER, "we have plenty of wood—we're not running short by a long shot."

He was referring, of course, to the vast stands of hardwood, which are finding increased use in the Northeast and Middle Atlantic; to the terrific potentials alone in chip utilization and, most important, to the possibilities of integrated logging.

In spite of increased attention towards Southern and Pacific operations, Northern operators are digging in with all their Yankee ingenuity and are coming up with plenty of new ideas.

One of the most important of these is Micova (Middle Connecticut Valley of New England). A study just published by the New England Council for Economic Development reveals a large volume of hardwood not in demand by existing industry, estimated at 11,000,000 cords. (Eds. Note: This is about ⅓ of total U. S. pulpwood consumption). "The opportunity lies not in entering into competition for this supply," says the report, "but in turning to advantage through installation of suitable plants, a large and dependable source of usable raw materials . . . for which competition is virtually non-existent."

Micova's land area of 2.9 million miles is 75% forested and on its 2.2 million acres of forest an estimated 400,000 cords may be harvested each year for 25 years with reasonable assurance that substantial quantities will continue to be available indefinitely, says the report.

An important factor, often overlooked by those who would quickly dismiss New England's potentials is that expansion in use of hardwood for pulp offers particularly attractive possibilities in New England which is situated almost in the center of the world's largest market for pulp and paper products. To the discerning, the manufacture of pulp and paper is a well-established industry—in New England—yet and there is still available an abundance of raw material.

INTEGRATED LOGGING . . . Chief difficulty to harvesting pulpwood or any kind of timber in the East is the unevenness of terrain. However, Brown Co., Berlin, N. H., has come up with one answer for this region. Integrated logging. (West Coast and Southern mills have been doing this for years.)

Integrated logging at Brown consists of harvesting sawlogs and pulpwood together to get the greatest possible return from the forests. At Berlin, Brown has 3 sawmills with a capacity of better than 25 million bd. ft.

AND SAWMILL CHIPS . . . Another important innovation in the East, and again, one pioneered in this region by Brown (although Fraser Companies, Ltd., leading pulp producer in the Maritimes, has been using chips from its sawmill operations in New Brunswick and Quebec for two decades) is sawmill chip utilization.

Brown is now using 15,000 cords of white pine chips from five sawmills. Because of the multitude of sawmills in this area, New England and Middle Atlantic, pulpwood industry observers see the trend toward greater use of sawmill waste.

MUCH MECHANIZATION . . . Some answers other pulp and paper mills have come up with are concentration yards (Champion-International); improved debarkers (Brown Co. has a new Soderhamn flail type debarker); mechanization (virtually all Northern mill operators have a considerable investment in cranes, tractors, trucks, etc. Some are Great Northern Paper Co., which has recently gone full speed into harvesting its own hardwood logs for its successful Chemigroundwood operations; Brown Co., which rents most of the equipment it needs and has a total fleet of some 250 trucks, 20 trailers, 15 cranes, 35 tractors as well as sul-

CASH CROPS IN THE NORTHEAST . . . This typical New Hampshire farm picture, from Brown Co. and American Forest Products Industries Inc., shows source of pulp for Brown and other New England companies.

kies, a road grader and fire trucks; and S. D. Warren Co., which has mechanized from stump to woodyard. This company also uses pallets.)

MANY ADVANTAGES . . . Here's how PULP & PAPER's Eastern editor sums it up: This area has many advantages, easily overlooked:

(1) It has the most heavily forested area in the U.S. Some 76% alone of New England is forested with commercial forests.

(2) More than half of U.S. paper mills are located here.

(3) This region is the most dynamic consumer area; with easy access, transportationwise, to markets already aware of the many uses of paper and paper products. It is a dynamic area with well-paid workers.

(4) Exceedingly important is the development of new processes for using the abundant hardwoods; providing a key in several instances for further expansion. Some examples: Great Northern, with its Chemigroundwood, is engaged in a $57 million expansion program; Gould Paper Co., at Lyons Falls, N. Y., on the verge of drastic cutbacks in production because of softwood scarcity, is going full steam ahead on a Chemigroundwood operation, said to be engineered by Bauer Bros., and the development of Neutracel by Hammermill Paper Co., at Lake Erie, Pa., has spurred greater interest on the part of fine paper manufacturers in using hardwoods. At Mechanicville, N. Y., West Virginia Pulp and Paper Co. is reported to be using 100% hardwoods for semi-chemical pulping in its fine paper grades. In the Connecticut Valley, on the outskirts of Holyoke, interest is being shown in a Chemigroundwood operation.

This report is by no means complete but simply indicative of trends towards revitalizing the pulp and paper industry in the East.

WESTERN CANADA:

4-WHEEL DRIVE UNITS AND SAWMILL CHIPPERS . . . Greater mobility and flexibility have been the guiding principles for recent pulpwood handling developments in Canada during the past year.

On the Pacific coast innovations have been powerful four-wheel drive units that have been introduced to operate in conjunction with conventional logging operations. R. G. LeTourneau, Inc., has been actively exploiting its electric arch and its big electric log loader or logging train, and LeTourneau Westinghouse has come out with a new 260 hp rubber-tired arch.

In the coastal district of British Columbia there is very little distinction between logging for pulpwood and for sawlogs, the sorting usually being done when the wood is being built into rafts for towing to the mills. For that reason the equipment used in the woods is more or less standard regardless of the end use of the log. All major processing companies have integrated operations so that they are able to utilize wood for a variety of purposes within the organization.

However, growing demand for pulp chips has resulted in installation of barkers and chippers in many of the smaller sawmills not associated with pulp mills. This has enabled many operators to turn a substantial profit from material previously regarded as waste, the chips being transported, usually by barge, to tidewater pulpmills.

THE MARK IV LOGGER making its debut in Canadian woods is described as the best yet developed for moving 4-ft. pulpwood out of the bush. Logger is fruit of combined efforts of member companies of Woodlands section of Canadian P&P Assn., and is said to be able to move easily, backwards and forwards, over almost any kind of terrain. It can negotiate streams and stumps with a load of 1.5 cords (about 3.5 tons) which it picks up, loads and dumps mechanically. Manufacturer was Bonnard Manufacturing Co., Montreal. Clark Equipment Co. will produce the logger in U.S.A. this summer.

EASTERN CANADA:

MECHANICAL "LOGGER" AND AERIAL CABLEWAY . . . In the woods of Eastern Canada the trend towards increased mechanization continues. Pulpwood producers have evolved a new machine known as "the logger" as the result of a program of research and experimentation financed by a group of companies under sponsorship of the Woodlands Section CPPA.

Development of a mechanically loaded tractor sleigh at Heron Bay, Ont., gave the designers of the new machine an idea to work on, and the finished product was turned out by Bonnard Manufacturing Co. of Montreal.

The machine is 18 ft. long and 9 ft. high. It moves easily on four 6 ft. tires over any kind of terrain, through streams and over stumps, carrying one and a half cords of pulpwood, about three and a half tons, which it picks up, loads and dumps mechanically.

During the past two seasons Quebec North Shore Paper Co. has carried out experimental operations using cable and aerial ropeway systems at Baie Comeau and Franquelin, and the results indicate the possibility of a new and economic method of hauling pulpwood in Eastern Canada.

The aerial cableway used consisted of two truck cables anchored at each end, supported by wooden towers built to various heights to permit the loads to clear the ground.

The load carrier ran on a track cable with either single or double wheels and was attached to the traction cable by a simple clipping device, below which the pulpwood carrying cradle was attached. The endless traction cable was driven by a 20 hp engine through a reduction gear and a 6½ ft. diameter driving wheel at one of the cable terminals. At the other end, the traction cable was passed around a bullwheel the same size as the driving wheel.

A new method for measuring pulpwood floating down a river or passing over a conveyor was demonstrated recently for Eastern pulpwood operators by representatives of Canadian International Paper Co. The device used consisted of a series of photographs of the wood taken at regular intervals as it moved downstream or up the conveyor. Floodlights provided illumination for the picture and a heater fan dispersed any early morning fog which might cloud the image. The operator simply counted the number of logs in each picture and calculated, with the aid of a formula, the amount of wood which had passed during the day.

Won't Let You Down in Mud—or anywhere else

Power, flotation and simplified lubrication of Allis-Chalmers HD-6 keeps it working profitably in swamps for loggers like Alex Chauffe of Louisiana

Snaking logs through swamp mud . . . that's what really tests the money-making performance of a crawler tractor . . . and that's what convinced Alex Chauffe of the superiority of Allis-Chalmers advanced-design HD-6. After using his HD-6 to bring oak, ash, gum and sycamore logs out of the swamps near Grosse Tete, Louisiana, Chauffe had this to say:

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It's the HD-6's advanced basic design that Alex Chauffe is talking about: the long-life Allis-Chalmers diesel engine with follow-through combustion for extra power . . . the 6 tons of *balanced* tractor weight and 20-inch track shoes that provide maximum flotation in mud . . . the 1,000-hour lubrication intervals that simplify servicing, give extra working time. Add an all-steel, box-A main frame, straddle-mounted final drives on tapered roller bearings, unit construction . . . plus many other features that mean the HD-6 won't let you down in mud, or anywhere else.

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LOOK TO THE ADVANCED-DESIGN HD-6 . . . 55 belt hp . . . 12,400 lb

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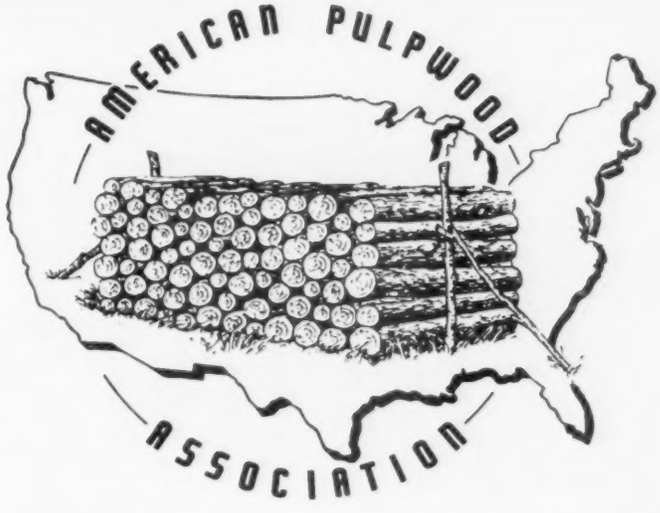

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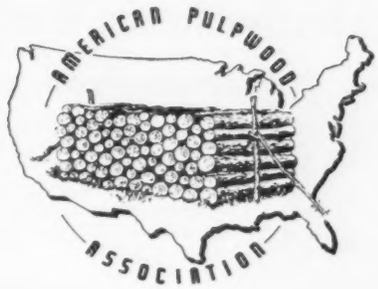

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FOREWORD

Each of the four issues of the PULPWOOD ANNUAL to date has been released with news of peak pulpwood consumption for the previous year. A volume of 33,313,000 cords consumed in 1955 represents the top level to date.

The papers presented at the Annual Meeting of the Association in February 1956 and reproduced in this issue of the ANNUAL also represent a top level of performance in keeping members of the pulpwood industry informed on pertinent issues.

We recommend this issue to the Producers and Consumers of pulpwood in this Country and abroad. The cooperative support of the PULP & PAPER Magazine (a Miller Freeman Publication) in making this and previous ANNUALS available is greatly appreciated by the members of the American Pulpwood Association.

W. S. BROMLEY
Executive-Secretary

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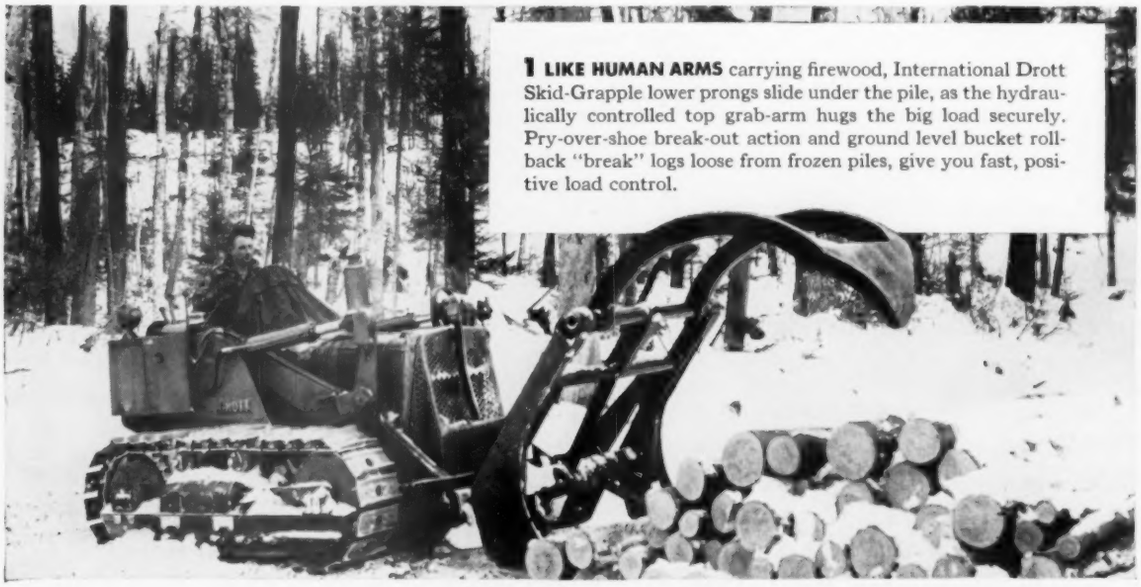
4 Ways International Drott Skid-Grapples

speed pulpwood production in the woods . . . at the mill!



1 LIKE HUMAN ARMS carrying firewood, International Drott Skid-Grapple lower prongs slide under the pile, as the hydraulically controlled top grab-arm hugs the big load securely. Pry-over-shoe break-out action and ground level bucket roll-back "break" logs loose from frozen piles, give you fast, positive load control.

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3 YOU PILE HIGH into trucks or onto piles . . . quickly, easily and with complete control because of Drott grab-arm "hug-action". Piling, skidding and loading operations are done with almost no "bull-work". Skid-grapple savings of $1.00 per cord are ordinary!

4 SELECTIVE DUMPING CONTROL permits releasing logs one by one, or all at once. Top grab-arm is controlled by third valve of hydraulic system, which can also be used to operate rear-mounted road-working equipment. Ask your International Drott distributor about Drott Skid-Grapple advantages in your pulpwood production. Call him today.

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LUCIAN A. WHITTLE

newly elected APA President

Lucian A. Whittle, General Manager, Woods Division, Brunswick Pulp and Paper Co., is APA's new president. His fifteen years in the pulpwood industry have earned for him recognition as a pioneer in new techniques of wood harvesting and wood handling. For instance, these are three of his more significant contributions to this industry:

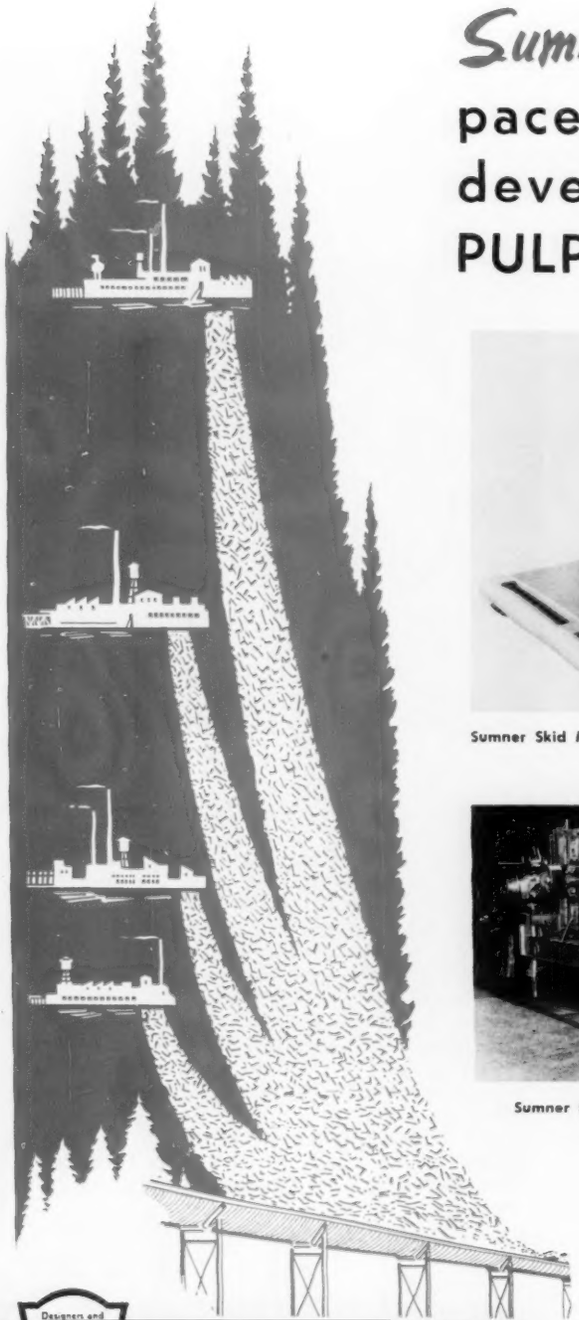
(1) The pulpwood pallet, conceived by Mr. Whittle in 1948, now in wide use in the South.

(2) Stabilization of wood procurement and the concept of pulpwood production as a regular, year-round occupation.

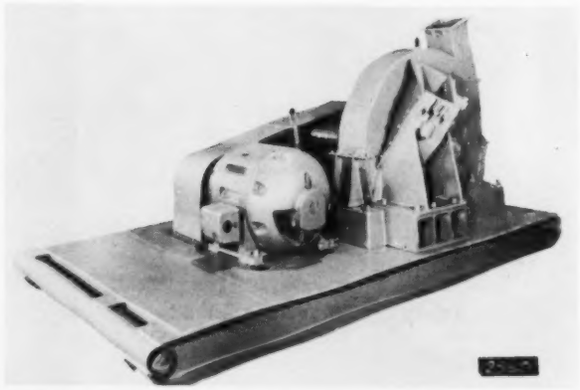
(3) The first application of Continuous Forest Inventory to give a continual measure of forest performance as a guide to improving forest growth.

He has long pushed intensive land management—what he terms the factory concept of land management.

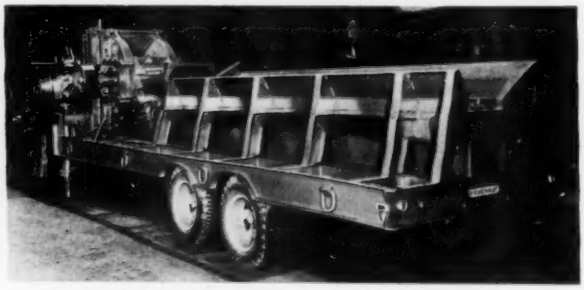
Brunswick-born, Mr. Whittle is a 1933 honor graduate of the University of Georgia. In Brunswick, he is a past president of Rotary, past president of Brunswick's Young Men's Club, and organized the first community chest drive there. He is a past director of the Southern Pulpwood Conservation Association, serves as an *ex-officio* member of the Board of Directors of the American Pulpwood Association, and played a major part in the formation and development of APA's Southeastern Technical Committee.



Sumner . . . is keeping pace with the rapid developments in the PULPWOOD INDUSTRY



Sumner Skid Mounted, Wide Spout Wastewood and Pulpwood Chippers.



Sumner Portable Chipping Plant now being tested in the field.

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The ever-increasing flow of wood leftovers from sawmills and veneer and remanufacturing plants has become more and more important with the increased emphasis on chipping . . . resulting in greater economy and more profits to the forest product industries.

Also, selective cutting, logging leftovers, and unused stands of timber formerly considered of little importance when compared with the major species in the "kingdom of evergreens and hardwoods" take on a new meaning . . . as Sumner portable units enter the field.

Our engineers are in constant touch with chip users and their requirements . . . maintaining Sumner's leadership in the manufacture of the most complete line of woodroom machinery, including all accessories.

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Chippers, Barkers, Screens
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Pulp and Paper Mill Machinery
Industrial Machinery
Steel, Iron, Bronze Castings

America's Supply of Pulpwood

(L to r standing) AL WORRELL, Yale School of Forestry; FRANK N. FIXMER, Mosinee Paper Mills; GEORGE B. AMIDON, Minnesota & Ontario Paper Co., Panel Chairman; DWIGHT B. DEMERITT, Dead River Co.; and H. R. "JOE" JOSEPHSON, U. S. Forest Service; (L to r seated) CARL V. SAHLIN, Puget Sound Pulp & Timber Co.; WILLIAM J. BRIDGES, JR., Union Bag & Paper Corp.; AL D. NUTTING, Maine Forest Service; LOWELL BESLEY, who at time of meeting was Executive Director of American Forestry Assn., but is now Chairman of Woodlands Research at Pulp & Paper Research Institute of Canada.

As USFS Sees Our Pulpwood Future

We must "learn to live with hardwoods"—by 1975 demand for timber will be up 17% to 29% over 1952

By H. R. JOSEPHSON
U.S. Forest Service
Washington, D. C.

● I shall try to discuss briefly the subject of present and future pulpwood supplies as disclosed by the Timber Resource Review. The first major point I would like to comment on is:

(1) Pulpwood supplies must be considered in the context of the overall timber supply situation since trends in general forest conditions will have a major influence on both the availability and price of pulpwood.

In first defining what we mean by pulpwood supply, we shall have to think in terms of an increasingly heterogeneous mixture of species and types of raw material.

Not long ago spruce and fir accounted for most of the wood used in the manufacture of pulp and paper. But with the increase in demand for pulpwood, rising wood prices, increasing scarcity of preferred species, and development of new or improved pulping processes, other species such as Southern pine and Douglas-fir and many of the hardwoods have been added to the list of woods widely used for pulp. Impressive progress is being made in the use of plant residues. The use of logging residuals, thinnings and cull trees is also increasing.

Our ideas of what is meant by the words "pulpwood supply" have been changing rapidly and it is a safe bet they will keep on changing in the years ahead.

Now this expansion of the raw materials base of the pulp industry gives it a great advantage. But at the same time, expansion of the industry brings pulpwood buyers into competition for timber with one another and with many other processing industries. The supply and the price of pulpwood in the future thus will certainly be influenced by timber supply as a whole, and by the total demand upon the timber resource.

Let me, therefore, summarize a few background facts about our timber supplies.

(2) Three-fourths of our commercial forest land is in the East but volumes are at present concentrated in the West.

The area of forest land in the North amounts to 174 million acres and in the South 193 million acres. The other ¼ of our commercial forest land—121 million acres—is in the West, including southeast Alaska. Because of such factors as remoteness, interior Alaska has been excluded from consideration at this time.

In contrast to 25% of our forest area in the West, 56% of the nation's inventory of timber growing stock is in the Western states. Most of the 292 billion cu. ft. of timber standing in the West is old-growth. Most of this volume is concentrated in large size trees.

All but 4% of the Western timber is softwoods. This large volume of softwood timber in the West—equal to 54% of all the wood we have—is the dominant factor in the present wood supply picture of this country.

Our Southern forests include 22% of the nation's growing stock volume—proportionally much less than the 40% of the nation's commercial forest land located in this region. Somewhat over

half of the growing stock in the South is hardwood.

Northern forests also contain about 22% of our total timber supply. Hardwood volumes in this area are approximately four times greater than the softwood volumes.

(3) Hardwood areas and volumes are of increasing importance.

In the West softwood types make up 97% of commercial forest land, whereas in the East hardwood types predominate. In the North, for example, 80% of the forest area supports hardwood types. In the South hardwood types (including the oak-pine type) cover 58% of the forest land.

Because the bulk of our commercial forests is in the East where hardwood types predominate, we shall have to rely on hardwoods in the future more than we have in the past. As old-growth timber in the West is cutover in the next several decades, we can expect a shift in the concentration of industry back to the East where the major part of our timber growing potential is located, and where population and timber markets are concentrated.

Hardwoods already account for nearly 70% of the growing stock volume in the East. Moreover, as a result of heavier cutting of the softwoods and large growth surpluses in hardwoods, the proportion of hardwoods is increasing.

Within limited areas it will be economically feasible to convert existing hardwoods to softwood stands. But so far, the trend has been toward more hardwoods. To what extent we can stop this trend and reverse it, without encountering prohibitive costs, is a question yet to be answered. At any rate the importance of increased hardwood utilization is apparent.

(4) Timber supplies include a wide variety of raw material.

Softwoods include 24 billion cu. ft. of poletimber and 24 billion cu. ft. of small sawtimber under 13 in. These are the sizes generally used for pulpwood as well as lumber.

Large sawtimber trees of sizes almost always used for lumber or other quality products total 26 billion cu. ft. In addition there are 4 billion cu. ft. (54 million cords) of sound wood in softwood cull trees. These by definition are unsuitable for lumber but usually can be used for pulpwood.

Hardwood timber volumes in the East include 69 billion cu. ft. of poletimber, 82 billion cu. ft. in sawtimber trees, and 37 billion cu. ft. (477 million cords) in cull trees. Hardwood limbs—although having little present use—also represent a large potential supply of 22 billion cu. ft.

With this brief general sketch of our timber supply, let us turn for a moment to trends in use and growth of these timber resources:

(5) Pulpwood has become a major competitor for timber.

Consumption of timber in 1952 in terms of the cu. ft. volume of logs and bolts used for various products, including the equivalent volume of net imports of lumber, wood pulp, and paper, totaled about 12.2 billion cu. ft. —or 157 million cords, roughly one cord per capita.

Pulpwood accounted for 22% of the total wood used, lumber slightly more than half, fuelwood 16%, and all other products 9%.

Consumption of lumber has been strongly upward since 1939 and in 1952 was about 8% under the all-time high which occurred back in 1906. Pulpwood consumption, on the other hand, has been increasing very rapidly. Increases for veneer logs and bolts also have been considerable.

Fuelwood consumption has been declining for a long time, but less than ¼ of the wood used for that purpose is now being cut from growing stock. The bulk of it comes from mill residues, dead and cull timber, and such sources as fence rows. Demand for fuelwood is expected to decline still further in contrast to industrial wood for which demands are expected to increase.

(6) Demands for timber products are rising and increasing competition is in prospect for softwood timber supplies.

The anticipated expansion of demand is of course due primarily to rapid growth of population, gross national product, and associated consumption of raw materials.

With respect to population, even if birth rates fall considerably below present levels the population of the United States is expected to increase from the 157 million of 1952, and the 167 million at present, to possibly 210 million by 1975, and to about 275 million persons by the year 2000.

According to this median estimate of prospective growth, by 1975 we may have 34% more people than in 1952, and about 75% more by the year 2000.

If long-term trends continue, it can be expected that the nation's total output of goods and services (that is, our gross national product) will also increase rapidly. We have estimated a rise from $354 billion of 1952 to possibly $630 billion by 1975 and $1,200 billion by year 2000. (These dollar estimates are in terms of 1953 prices.)

The increase in Gross National Product by 1975 would thus be about 78%. By the year 2000, the increase may be of the order of 240%. These projections, though startling, are in line with our long-term economic growth.

Such future economic growth will certainly require a big increase in the consumption of basic raw materials. The 1975 estimate of raw materials use is 40% above 1952. The estimate for 2000 is 105% above 1952. These are about the increases that would permit us to step up per capita consumption of raw material at approximately the same rate as during the past 50 years.

The question, of course, is: will demand for industrial wood keep pace with demand for other raw materials? The answer depends largely on future prices of industrial wood in relation to prices of competing materials, and upon various technological factors.

Projections indicate that in 1975 demand for timber products, including fuelwood, might range from 17 to 29% above 1952 consumption. Demands in the year 2000 might be from 47 to 80% above 1952 consumption. The lower estimate of 1975 demand is based on about the same assumption and comes to about the same result as that developed in a similar study made by the Stanford Research Institute.

For pulpwood our lower estimate for 1975 is 42 million cords of domestic wood, or 67% above 1952 consumption. This estimate assumes considerable technological improvements and shifts to hardwoods and high-yielding processes. The lower estimate of potential demand for lumber in 1975 is about 11% over 1952.

I know it may sound conjectural to talk about possible demand in 1975 and the year 2000. But these dates are only 20 to 45 years away and this is a comparatively short period in the life of a pulp company, particularly in terms of time required to expand our production of timber crops. As a basis for programs, the specific figures also are probably not as important as the general magnitude and direction of these trends.

In comparison with the estimates of potential demand, where do we stand in terms of available growth?

(7) Timber growth-cut relationships currently are relatively favorable.

Since release of the Timber Resource Review report, much has been made of the fact that timber growth now exceeds timber cut. That is a true statement of the facts, but it is not the whole story. Comparisons of

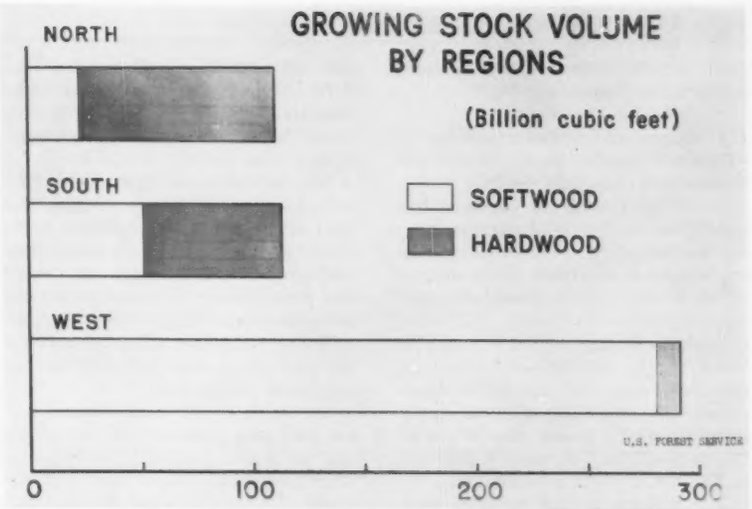
growth and cut on the overall basis are not very meaningful—and they may be quite misleading.

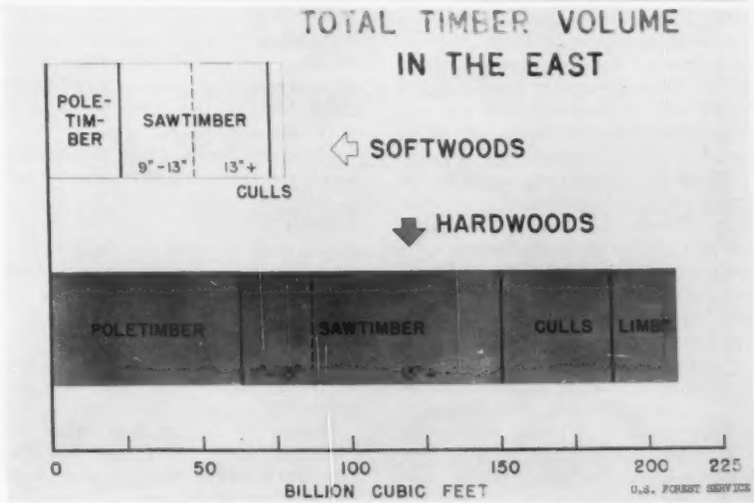
It is highly encouraging that Eastern softwoods showed a surplus of growth in 1952 of about 8 million cords. (The growth surplus for white, red, and jack pines was nominal. For Southern yellow pines, the surplus amounted to about 6 million cords; for spruce and fir, 0.6 million cords; and for other Eastern softwood, 1.6 million cords.)

This surplus marks the reversal of a long downward trend in timber supplies in the East. It is due in part to a reduction in lumber cut as the center of lumber production has shifted increasingly to the West. Use of fuelwood also has dropped considerably. To a major degree, however, it also reflects a substantial drop in mortality and improved stocking resulting from fire protection and other forestry programs.

Growth of hardwoods exceeded cut by some 49 million cords. (Softwoods showed a surplus of 17 million cords, the oaks 15 million cords, the Northern hardwoods—beech, hard maple and birch—about 5 million cords, and other dense hardwoods about 12 million cords.) It is not difficult to understand that our problem is in finding new uses for hardwoods, particularly for the low-quality species and trees that make up most of this surplus.

On the other side of the ledger, we have a deficit in growth over cut in the Western softwood species—about 14 million cords in 1952. Growth shortages in the West are of course to be expected so long as we still have a substantial quantity of old-growth timber in that area.





(8) Prospective growth through 1975 is about equal to the lower estimate of potential demand.

If our progress in forestry continues as indicated by recent trends—and this means substantial progress—and if the timber cut were to steadily rise to the projections of demand plus a small safety margin, we might still have a small surplus of growth of Eastern softwoods in 1975, plus a substantial surplus in Eastern hardwoods. Growth of Western species might increase to nearly equal the projected demand. Thus, with the lower projection the situation looks quite good for the next 20 years or so.

But in the last quarter of the century, if expansion of demand and cut continues along with the assumed progress in forestry, the surplus of Eastern softwoods would be replaced by a growth deficit. The growth deficiency in Western species would also become greater. The Eastern hardwood surplus would be reduced.

(9) The upper projection of possible demand could not be met with prospective timber growth.

Such a large expansion of output over the next few decades could not be met without liquidation of considerable growing stock and reduced growth, and over the long run would be possible only with greatly accelerated forestry measures.

Computations such as shown in these projections are of course only roughly indicative of what may actually happen. It is quite possible, for example, that actual demand might lie between the two projections. Forestry efforts also might be more or less than has been considered likely.

Our major point is that the tremendous expected expansion of the American economy will bring increased demands for pulpwood, lumber and other industrial wood products, as well as other basic raw materials. These projections show that prospective supplies, including both standing timber and new growth, could sustain a considerable expansion of pulpwood output, plus increases in the cut of lumber and other products.

(10) Future supply problems pertain chiefly to quality products.

As Western old-growth timber is liquidated, supply problems will surely increase for lumber and other products such as plywood which utilize relatively high-quality timber. This will probably lead to increased prices for sawtimber, particularly for high-quality timber and the preferred softwood species.

The pulp industry can use timber that is too small or low-grade for lumber or other products requiring high-quality timber. Because of the competitive strength of the pulp industry, production undoubtedly can also be expanded even at the expense of other industries.

Pulpwood and sawlog sizes overlap, however, and wood procurement is directly or indirectly competitive to a significant degree. Hence, we may ex-

pect impacts on both the availability and price of pulpwood.

(11) Opportunities for expansion of pulpwood supplies lie in use of hardwoods, cull trees, and residues.

If our analysis of the future is reasonably correct, one obvious strategy for the pulpwood industry in expanding output is to exploit those sources of wood where there is least competition.

As brought out earlier, our surplus wood supply consists of hardwoods, including many of the softer hardwoods. The economics of wood supply seem to clearly favor greater use of these species and intensified research in hardwood pulping technology.

The volume of cull trees on commercial forest land—about 700 million cords—is equivalent to about 23 years of pulpwood cutting at present rates. In the West salvagable dead timber—about 100 million cords—is also an important potential supply of pulpwood.

There are likewise opportunities for greater use of logging and plant residues. There is annually available about 4 million cords of Eastern softwoods and 5½ million cords of Western softwoods on logging operations, and nearly 8 million cords of Eastern hardwoods.

Unused plant residues suitable for pulping include about 2½ million cords of Eastern softwoods and nearly 4 million cords of Western softwoods. Use of all such residues for pulp certainly will not be economically possible. But the figure of 1.6 million cords of plant residues used in 1952, for example, undoubtedly can and will be substantially increased.

Utilization of culls, thinnings, and residues, and hardwoods in general is of course a matter of local economics. But there are undoubted opportunities to use such sources for part of the industry's expanding wood requirements.

(12) Timber supply can be increased by more forestry efforts.

In addition to making greater use of the timber we already have, the other approach to the supply problem is to grow more timber—particularly softwood timber. Past forestry efforts have resulted in tremendous improvements in timber supplies. This is unquestionably a major reason why pulpwood prices have shown so little increase compared with other commodities.

Stocking can be improved over large areas. About 77% of our commercial forest acreage is stocked 40% or better. But 15% has a stocking of only 10 to 40% and 9% has less than 10% stocking. On much of our forest area cull hardwoods or brush occupy space that could be growing merchantable timber.

We have come a long way in providing organized fire protection, but that job is not yet completed. As of 1952, about 15% of our forest land had protection adequate for the worst fire years. About 58% had protection adequate for average years. Another 15% had protection adequate only for the easy years. And 12% still had no organized protection.

On much of our understocked forest land tree planting will be necessary to restore productivity in a reasonable period. There are approximately 52 million acres of plantable land technically suitable for the establishment of plantations. This is about 10 times the area of 5.2 million acres of acceptable plantations existing in 1952. Most of the plantable land is in private ownership.

Mortality losses from destructive agents equal about ¼ of the annual net growth. Mortality caused by insects amounts to about 5 billion bd. ft. annually, tree diseases 2.3 billion, fire 0.8 billion, and other agents (including storms) 4.6 billion bd. ft. Fire, of course, is potentially the most dangerous if not kept under vigilant control. Of the total mortality of 12.5 billion bd. ft. in 1952, about 24% was recovered in salvage operations.

Destructive agents also result in additional losses of future growth. Fire, for example, destroys seedlings and saplings which are not included in the current mortality figures. In 1952 these future losses caused by destructive agents of all types were all estimated at 31 billion bd. ft. The largest growth loss was caused by tree diseases, 17.6 billion bd. ft. Next in order came fire with 6.6 billion, insects 3.6 billion and other destructive agents 3.3 billion bd. ft.

Total elimination of such losses is, of course, a physical and economic impossibility. But even moderate progress in the improvement of forest protection will pay handsome dividends in the form of increased growth.

(13) Increased timber growth depends largely on nonindustrial ownerships.

Public ownerships include about 27% of our commercial forest land. Forest industries hold 13% with pulp and paper companies in 1952 holding about 5% of the commercial forest land. About 34% is in farms, and 26% is held by a miscellaneous and diverse group of private owners.

Farm and other private nonindustrial ownerships—mainly small holdings—thus comprise about 60% of our commercial forest area. They support about 40% of the present standing timber. They represent a major part of our timber-growing capacity.

The productivity of recently cut lands in these farm and other private ownerships is relatively low, in contrast to the holdings of public agencies and forest industries. About 80% of the recently cut public land rates in the upper productivity class. Forest industry lands rate about the same.

On farm forests, however, only 41% of the recently cut lands are in the upper productivity class, and on other private ownerships 52%. These farm and other private ownerships produce a major part of the pulpwood cut. Hence, their present poor condition and the cutting practices on these lands are of particular importance to this group.

As Heyward and others have pointed out, such facts emphasize the need for more effective fire control, better cutting practices, and investments to build up growing stock. The work being done by pulp companies and other forest industries, and the cooperative programs of the states and federal government to protect forest resources and assist owners of small forest properties are of critical importance for future growth.

(14) Summary of major points.

In conclusion, let me summarize briefly a few of the major points I have been trying to make.

(1) Problems of pulpwood supply cannot be considered apart from the total timber supply situation. The raw materials base of the pulp industry has been expanding rapidly as a result of technological developments which permit use of more species and a greater variety of raw material.

(2) The dominant element in our timber supply at present is the softwood sawtimber of Western old-growth stands. Hardwood forest types, however, now occupy about half our commercial forest land, and hardwood acreage and volume are increasing. We shall have to learn to live with the hardwoods for pulpwood and other products.

(3) Pulpwood has become a major use of timber and competition for wood is increasing. Competition for softwood supplies in particular will undoubtedly intensify with the rapid increases in timber demands accompanying an expanding national economy and a growing population.

(4) Total demands for timber by 1975 have been estimated at from 17 to 29% above 1952 consumption. By the year 2000 potential demand might range from 47 to 80% above 1952 consumption.

(5) Projections of anticipated timber-growth (on the assumption that forestry efforts will continue to be intensified as indicated by recent trends) indicate that the lower projection of demand can be met for some time. Continuation of rapid economic growth, or the higher estimated level of demand, will lead to shortages unless forestry efforts are intensified.

(6) The chief supply problems will be for the higher quality timber products. The pulp industry is in a relatively favorable position for wood supply, partly because of its ability to utilize cull trees, residues, and other low-quality wood. The industry has a strong economic interest, however, in the production of abundant and low-cost softwood growing stock.

(7) There are large opportunities for increasing the growth of timber by improving stocking on much of our commercial forest land, by tree planting, and by improvements in forest protection to reduce growth losses.

(8) The heart of the problem of increasing timber growth lies with farm and other nonindustrial owners of forest properties. (These ownerships include about 60% of the commercial forest acreage and about as much of our potential timber growing capacity. They constitute the principal source of the pulp industry's wood supply. Yet most of these holdings are of relatively low productivity.)

Much has been done to assist these and other forest owners. But more forestry efforts will be needed if our timber resources are to contribute their full potential to our nation.

How Timber Review Should be Revised

Why speculate about 2000 A.D.? Is "high level" projection propaganda? First, make future less risky for producer

By A. C. WORRELL
Yale School of Forestry
New Haven, Conn.

● The Forest Service in preparing to release the findings of the Timber Resource Review, which Mr. Josephson has so ably summarized, took the stand that all of us should have a chance to study the report in a preliminary draft and suggest changes before it was published in a final form.

The Forest Industries Council recognized the tremendous job it is to read—let alone digest—all the material on its 1073 pages, but still felt that someone should make a thorough study of the report. So they retained Professor John A. Zivnuska of the University of California for two months and asked him to prepare an impartial appraisal of the Timber Resource Review. These are his personal views and not necessarily those of the Forest Industries Council.

I think Dr. Zivnuska's appraisal of the Timber Resource Review can be summarized in five main points:

(1) This is a better study and presentation than any the Forest Service has prepared before on this subject. If carefully revised, it can be a valuable base for planning. But it does show that we need better data for the future.

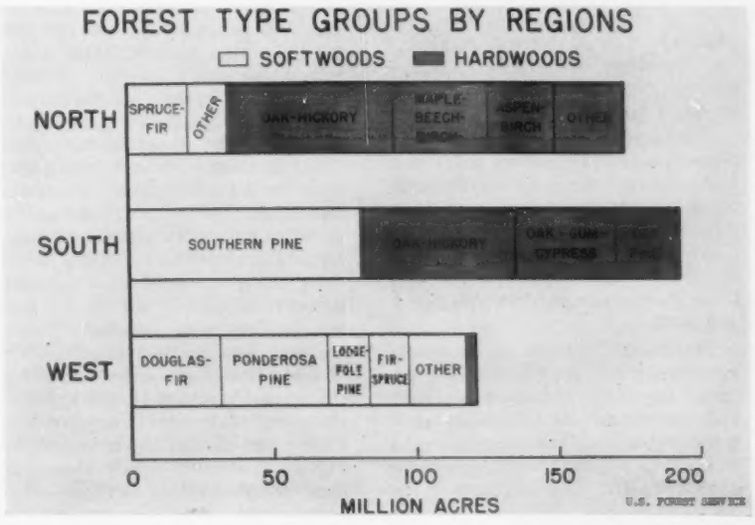
(2) The report does not emphasize enough the accuracy and uncertainty of the basic data and of the methods used to obtain them. And it does not clearly state how much confidence we can place in the conclusions it draws from these data.

(3) All the estimates of the situation in the year 2000 are extremely uncertain. The report should place more emphasis on the period between now and 1975 and less on the uncertain period thereafter.

(4) The lower level projection of the future situation could be made fundamentally sound by basing it directly on the lower level requirements estimates. It might also be useful to show a range of possible outcomes under assumptions that future cut and growth prove to be higher or lower than estimated.

(5) The upper level projection of the future situation does not serve any useful purpose in the analysis and might best be dropped from the report.

LACK OF SOUND DATA—Now let's see what Dr. Zivnuska has to say on these points. He has written a frankly critical appraisal, as everyone hoped he would. However, you cannot help but read between the lines of his criticisms considerable respect for the job the Forest Service has done on the Timber Resource Review. We run across phrases such as "technical ingenuity and clever use of available data." But we also find him repeatedly using phrases like, "The extremely limited data available . . . are not adequate to enable definite conclusions." His strongest point—and this runs throughout his entire analysis—is our lack of really sound information on which to base a study of our forestry situation.



NEED FOR EVALUATION—This carries over to Dr. Zivnuska's second point. Here he criticizes the Forest Service specifically for the way it has presented its entire report. In his own words, he feels that "The state of knowledge should be clearly shown as an important element of the forest situation." And this the Forest Service has failed to do too often.

"The data presented range from the results of complete enumerations and scientifically designed sampling surveys to the judgment of experienced field men and even to conjecture. There is throughout the report a need for the evaluation of the accuracy and uncertainty surrounding the data used and for shifts in emphasis from the less reliable to the more reliable data."

The most reliable figures in the Resource Review are the estimates of forest area and inventory volume. Even here—and the Forest Service does point this out—complete up-to-date Forest Survey data were available for only 52% of the commercial forest area. The basis of these estimates should be explained more fully.

SOURCE OF ESTIMATES?—There is not enough information on how the estimates of current timber growth and timber products output were obtained. Estimating growth is one of our most difficult problems in mensuration. The methods used and the possible sources of bias should be clearly stated.

Chapter IX of the Review does give information on the sampling error of the growth estimates. But this takes care only of the uncertainty which is due to basing the estimates on samples. It does not tell us anything about the uncertainty of the method of estimation which was used in these samples. There is at least a possibility that the errors inherent in the methodology may be greater than the sampling errors.

The sources for all the estimates of timber products output are not shown. Unfortunately we have no regularly compiled statistics covering the output of all timber products in the United States. So the report should explain how estimates were obtained for such products as fuelwood, piling, and posts.

Finally—and this is an extremely important point—any discussion of detailed comparisons between growth and cut should emphasize the sampling errors and other uncertainties inherent in the data which are being compared. Dr. Zivnuska says quite bluntly, "It is probable that some of the detailed comparisons presented can have very little meaning due to the sampling error and uncertainty of the data."

NEW CONCEPTS—In considering destructive agencies, the Resource Review introduces two new concepts: "growth loss" and "growth impact." The methods by which they were estimated and the problems which this involved are not made clear. The Forest Service estimates that the growth impact—that is, the loss over a period of years in the future—resulting from 1952 damage by fire, disease, insects, and other destructive agents will amount to 40 billion bd. ft. We can hardly accept figures of such magnitude unless they are supported by strong evidence of validity.

The Review also introduces another new concept in the "productivity index" which is used to appraise the forest condition of recently cut lands. This index is not a direct measure of either economic or physical productivity. It is simply an arbitrary system of combining certain elements which are more-or-less related to forest production.

The discussion of the specific elements—existing stocking, prospects for stocking, species composition, and felling age—does give a picture of the results of present cutting practices. But the combination of these into one index seems to obscure more than to simplify the findings.

Trends in timber volume and timber growth cannot be determined by comparing the results of successive reviews of the forest situation. The basic data are not adequate because different standards and units of measurement were used in each review.

The Forest Service has recognized this and presents adjusted estimates for the earlier periods. These adjustments take care of changes in standards and also correct what apparently were mistakes in the earlier estimates. However, they seem to have been made in large part by working back from the 1953 estimates with certain assumptions about the changes in growth and inventory which must have taken place.

So citing these adjusted values in support of the assumptions from which they were in part derived seems to be a questionable procedure. If the adjusted estimates are left in the revised report, it should include a clear explanation of the way they were adjusted. The report also should explain that any trends shown by these adjusted values can have only a limited meaning.

NEED FOR QUALITY DATA—The discussion of changes in timber quality could be improved. The Review fails to develop clear criteria for desirable relationships. And the fact that most changes are shown only in percentages is often confusing. The emphasis in the report is on the quality of the inventory. Changes in the quality of the growth are largely ignored. What needs to be made clear is that the nationwide quantitative data we have today is hardly adequate for a detailed analysis of changes in timber quality.

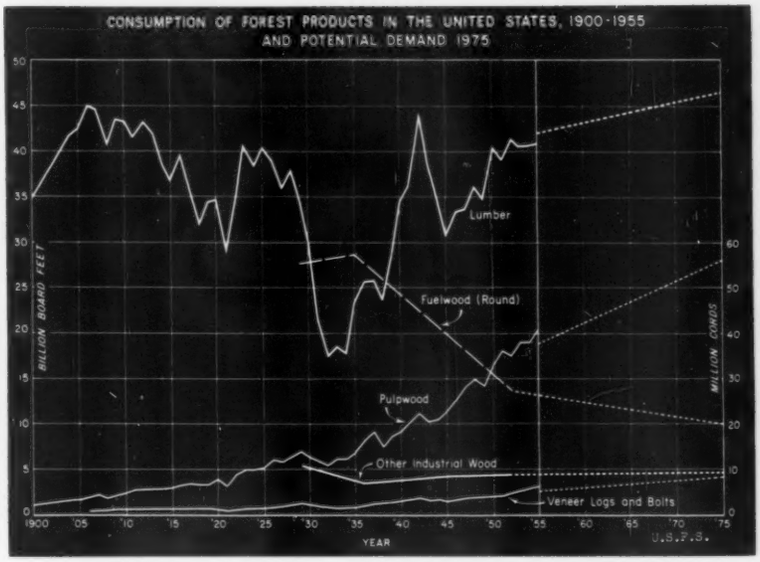
So much for the past; now for the future. Dr. Zivnuska is still hammering at his second main point. I'll let him do it in his own words. "The method of predicting future forest growth up to the year 2000 is covered by a single uninformative sentence. If the Forest Service wishes its analysis to be accepted on any grounds other than faith, it is essential that . . . the growth prediction be clearly described, the major assumptions presented, the possibilities of bias indicated, and the degree of reliability or uncertainty involved in the projections evaluated."

Now we move to the year 2000. The Census Bureau has made predictions of future population only as far ahead as 1975. So these population estimates have to be extended for an additional 25 years. And some highly uncertain projections of productivity trends must also be made.

Any attempt to forecast the economy of the future is based on numerous economic assumptions. Differences in the assumptions which might have been used cause only small differences in the projections for 1975. But as these projections are extended further, the differences between them will keep increasing and by the year 2000 they may be very large.

The Timber Resource Review estimate of lower level requirements for 1975 checks within 1% of a similar estimate made by the Stanford Research Institute. This is not proof that the estimates will come true, but it does increase our confidence in them.

For the year 2000 there are no independent estimates at all which can be used to check the Forest Service figures. Dr. Zivnuska does not say that this long-term projection is valueless. In fact he feels that it gives some useful indication of future conditions. But he does object to a tendency in the Review to be equally positive about the 1975 and 2000 projections and even in some places to put the greater emphasis on the 2000 estimates.



TWO PROJECTIONS FOR FUTURE—The Resource Review differs from previous reports by presenting two projections of the future forest situation. Both are based on the same estimate of what the future general economy will be like. Dr. Zivnuska feels that this projected future economy is all right as far as 1975 because it is based on or is consistent with other studies of this kind.

The Forest Service obtained its two projections of the forest situation in this future economy by working forward from 1952 with two different sets of assumptions about future wood requirements. Both projections assume that timber cut each year will gradually increase enough to meet the rising trend in potential demand and that forestry will continue to advance as indicated by recent trends.

For its lower level estimate of future requirements, the Forest Service assumed that wood product prices will continue to rise and that past substitution trends will also continue. It then projected the use of each product into the future under these conditions. Dr. Zivnuska feels that these lower level estimates of requirements give us a useful picture of probable future trends in consumption.

The Resource Review does not show what the future forest situation will be if the lower level estimates of requirements prove to be true. Instead, these estimated requirements are increased by a "margin for contingencies." This adds 5% in 1975 and 15% in 2000 to the requirements.

If this margin for contingencies is left out, the Review's estimate of future growth actually exceeds the estimated lower level requirements. Dr. Zivnuska recalculated the figures in the report and came up with a 10% excess of growth over drain from 1975 on. He doesn't use this in any attempt to prove that future growth will exceed drain but points out that the answers you get depend on the assumptions you make.

"LOWER LEVEL" AS BASIC DATUM—Since the lower level requirement estimate is the result of a painstaking attempt to project future consumption, it might logically be used as a datum. From it we could then estimate what the future situation might be if the original assumptions do not prove to be true.

The report does not establish a clear probability that the lower level estimate is more likely to be too low than too high. But the only analysis in the Review assumes that these estimates are too low by the amount of the margin for contingencies.

Dr. Zivnuska suggests that it would be better to work out analyses for all possible situations. These possibilities are that the lower level requirements and growth estimates might be correct, that the requirements estimates might be too high or too low, and that the growth estimates might be too high or too low.

Dr. Zivnuska concludes from the lower level projection that starting with our present forest base it is possible for industry to expand production and for timber growth and inventory to increase at the same time. In the actual progress of such a development there would have to be a continuous adjustment between the rate of cut and the rate of growth.

The Resource Review projection to 2000 does not appear to allow for any such adjustment during the intervening years. Thus the situation pictured in the Review will probably never be reached because we can expect the assumptions underlying the projection to change as time moves along toward the year 2000.

"UPPER LEVEL" SHOULD BE DROPPED—For its upper level estimate of future requirements, the Forest Service assumed that industrial timber products will continue to occupy the same relative position in our total consumption of physical-structure materials that they did in 1952. It also assumed that there will be no appreciable increase in the real price of wood compared to its competing materials. Dr. Zivnuska does not like this upper level projection at all. In fact, he recommends dropping it from the revised report.

The upper level requirements are not an estimate of probable consumption trends. Dr. Zivnuska feels that these are shown by the lower level estimates. The upper level estimate assumes that wood will maintain its place in the economy without any change in price. This means that no non-price factors—such as the development of superior substitutes—will reduce the uses of industrial wood. This assumption is hard to accept in our actual economy.

The lower level projection was developed product by product. There is a good chance that if the assumptions used for one product prove to be under-estimates this may be offset by overestimates for other products. So the total future requirements estimates are probably more accurate than those for any one product.

The upper level projection was developed by an entirely different procedure and the chance for such compensation is limited. The first step in the projection apparently was to estimate future population and future per capita consumption of physical-structure materials. These were combined to give an estimate of "physical-structure material intake" in 1975 and 2000. It was then assumed that wood will make up the same proportion of this intake as it did in 1952.

PROJECTION UNCERTAIN – Per capita consumption of physical-structure materials has not followed a definite trend in the past. The trend line fitted to this data by the Forest Service is not obviously better than other lines which might be fitted. For this reason, Dr. Zivnuska considers the projection of future per capita consumption of physical-structure materials to be extremely uncertain. And since this is the basis for the estimated wood requirements, the whole projection is very shaky.

There is bound to be a continual adjustment between supply and demand as time passes. For this reason, the present basic assumptions about the progress of growth and cut will become unrealistic long before the year 2000.

The Forest Service recognizes this and says so in the report. Still the conclusions in the Resource Review are based on the results of holding these impossible assumptions all the way to 2000. To Dr. Zivnuska this means that the analysis can only be described "as a projection of what will not happen."

Finally, Dr. Zivnuska objects to the assumption that there will be no appreciable increase in the relative real price of forest products. The Timber Resource Review speaks of a "tremendous challenge" for American forestry. It defines this challenge as "the desirability of maintaining the position of timber in the national economy and to avoid the relative price increases for timber products implicit in the lower range of demand." This implies that expanded forestry activities actually could accomplish this.

Now Dr. Zivnuska is all in favor of expanding forestry activities. But he objects to the idea that we can thus prevent price increases of forest products in the future. The actual results—in terms of wood grown—from expanded forestry activity will develop slowly and they can have only a limited effect on the availability of timber by 1975.

In order to increase growth we must first increase the amount of growing stock on the ground. And the immediate effect of reserving timber to increase growing stock is bound to be a decrease in the amount of timber which can be cut.

Now, to bring this appraisal of the Timber Resource Review back into perspective and to make sure I don't leave you with an impression of carping criticism, I want to quote Prof. Zivnuska twice more. In a recent letter to me he said, "What we all are after is to clarify and improve the TRR in its revision." And I think the most significant statement in his report to the Forest Industries Council is, "A carefully revised Timber Resource Review (can be) a valuable basis for planning for expanded output of forest products and expanded forest growth in the future."

Now I would like to make a few comments of my own.

WHY PROJECTIONS OF FUTURE—Why do we try to make these projections of future situations anyway, when they are so fraught with uncertainty that we are almost sure to be wrong? This may seem a stupid question to anyone in the forestry business. But we certainly imply it every time we question a report like the Timber Resource Review in an offhand manner.

My reason for spending so much time on Dr. Zivnuska's criticisms of the future projections is that he never actually suggests that we might just give up the whole idea. Prof. Simon Kuznets described our situation pretty clearly in a recent book on long-range economic projection. He said, "The choice is not between making and not making an extrapolation into the future; it is between making projections in overt and sometimes quantitative terms, and proceeding by feel and faith. Even inaction implies some picture of the future."

In forestry we have to face up openly to the fact that we are dealing with a long-time proposition and cannot operate successfully on a day-to-day basis.

But how can we look into the future in open and quantitative terms? The Forest Service made a noble effort to do just this in the Timber Resource Review. They have not done a perfect job. But this is certainly much better than any previous projection we have had.

There may be a key to our problem here. The process of projecting improves with experience, just as any other activity does. A tremendous amount of effort is going into the making of economic forecasts today. The Department of Commerce, National Bureau of Economic Research, and others are actively at work and improving their techniques all the time. The development of knowledge is a cumulative process.

So everything any one of these organizations learns can help improve our forestry projections. We will never foresee the future clearly, but we are getting so we can see it better.

Another factor is also significant. The Timber Resource Review estimates for 1975 are better than those in the President's Materials Policy Commission Report, which was based on the 1944 Reappraisal.

This is not a case of hindsight being better than foresight. The distant scene naturally becomes clearer as we approach it. Conditions change with time, as population growth has so dramatically demonstrated in recent years. We need to keep revising our projections as we become aware of these changes.

NEED FOR LONG-RANGE DATA—To me, this means that we need in forestry some way of keeping current the best possible projections of future demand for forest products and future trends in timber growth. This should not be a series of one-shot studies at 6-, 8-, or 10-year intervals like we have had in the past. It should be a continuous process in which the estimates are revised at short intervals.

In order for an organization to do this, it would need resources to make intensive studies of the demand for forest products and of methods of predicting future timber growth. Our present knowledge is very limited in both of these areas. I rather hesitate to suggest the establishment of a Bureau of Long-range Forestry Projections. But I honestly think we need something like that.

In the past, we have always tried to predict what demand and growth would be at certain fixed future dates. But what we really need is projections of the time paths of future changes in demand and growth.

It might be interesting when fighting a forest fire to know that the head of the fire will pass some point in the forest at two o'clock in the afternoon. But for a really effective suppression job you need to know in which directions the fire is spreading and how rapidly it is moving in each direction.

Land managers and manufacturers could plan more intelligently for present and future operations if they had reasonably good projections of what demand and growth might be at short intervals off into the indefinite future, and especially if those estimates were revised frequently. It would be even more helpful to have a series of time stream projections based on various possible assumptions, with some indication of which is most likely to prove true.

Free private enterprise might maintain a satisfactory relationship between supply and demand for wood products if it had this information on long-term demand and growth trends. But we cannot count on this to work out automatically. In the long run, supply and demand always balance, for consumption cannot exceed production. The trouble is that they may not balance at the best possible volume.

In our free enterprise system, supply depends on the actions of many individual producers. But the course of action which is most profitable for an individual producer may not always be most satisfactory for society as a whole. This is particularly true in forestry where some actions may appear most profitable to the individual only because of the long time period and uncertainties involved.

THE SOCIAL VIEWPOINT—The Forest Service has the responsibility of looking at these things from the social viewpoint. In the Resource Review they point out that substitutes may permanently displace wood—even in uses where it is superior—if wood products become scarce and the consumer forms a habit of using the substitute.

We might actually be able to produce wood cheaply enough to undersell the potential substitutes and still not turn out enough to hold the market because individual producers feel the future is too uncertain to gamble on making the necessary investments now. If wood is actually the most economical material for this product, its permanent displacement by a more expensive substitute would be a real social loss.

The Forest Service has the duty of warning us of the possibility of such social losses. And we may expect them to call for some form of governmental action if they become convinced that private efforts are not sufficient to avoid these losses.

In the Timber Resource Review, the Forest Service paints for us a picture of a huge potential market for wood products in a country which has the resources to supply that market and give the producers a fair profit in the process. The Review's high level estimate of the forest situation may be "a projection of what will not happen," as Dr. Zivnuska says.

But the Forest Service apparently also considers the lower level estimate to be a projection of what does not need to happen. Projections of the future always influence our actions in the present, especially if the situation which we foresee is an undesirable one.

I believe that the Forest Service by including the higher level projection is deliberately trying to influence us to set our sights on something higher than the lower level situation.

If this lower level situation is what might develop from leaving individual producers to their own devices in the midst of uncertainty and the difficulties of longtime planning, then I think we can be sure that it is going to involve some social losses.

It seems to me that the only way we are ever going to assure a socially-desirable supply situation in forestry is through some kind of group action which will offset the risk for the individual producer. But I don't see any reason why this need take the form of a governmental program unless private groups, like the American Pulpwood Assn., move too slowly.

How State Foresters View TRR

By A. D. NUTTING
Maine Forest Service
Augusta, Me.

• Comments on the Timber Resource Review are difficult to make because of the many factors one should consider before making them. In fact, one should have weeks of study before doing it as was done by the reviewer of the Forest Industries Council.

I believe my best contribution to this panel will be a few comments from state foresters representing different states on their estimates of its value to their states.

One state forester said it will be helpful to him in three ways: (1) It indicates a favorable trend in forestry is taking place; he is referring to improved forest practices and growth compared to drain; (2) It is a challenge to foresters, forest industries, and landowners to meet increased demands for forest products resulting from larger populations; and (3) It emphasizes and points up the need for accelerated forest protection.

Another state forester says the Review brings into focus for him the potentialities of the timber resources in his state. In addition, it emphasizes that the big forest job immediately ahead is in the small diameter timber sizes.

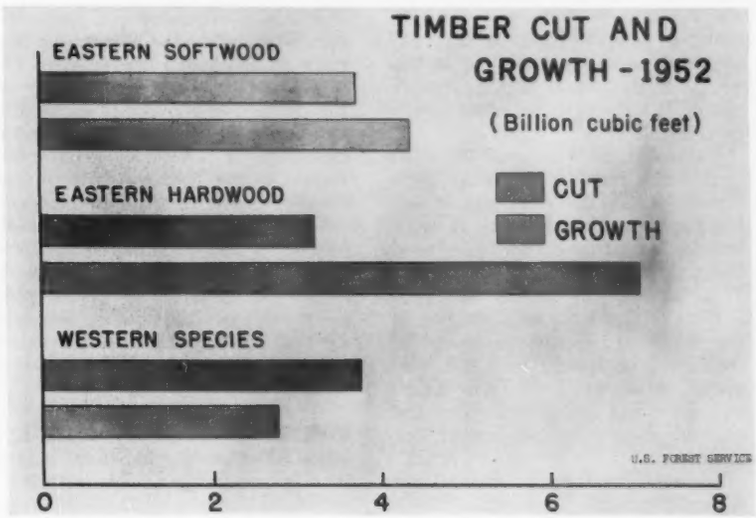
The viewpoint of another state forester is that it provides his state with information necessary for an orderly expansion of the pulpwood industry by bringing into consideration the ability of the land to produce, as well as present timber stands. It should be mentioned, and probably emphasized, that his state had recent forest survey data upon which to base the Review.

From another state the viewpoint was expressed that better cooperation in providing necessary data could have made the Review more valuable to him and to his state.

VIEWPOINTS VARY—These viewpoints from widely scattered states probably indicate that thinking on and value of the Review, when applied locally, will vary state by state. Naturally this will have effect on its nationwide values. I believe state foresters generally believe the Review, considering all factors, is valuable and well worthwhile.

The small ownership problem and its importance to national timber supplies is brought sharply into focus. The Review indicates to me more than ever the need for cooperation in this problem on all levels—owner, industry, consulting and public foresters—if progress is to be made.

It seems to me that there is general acceptance of the fact that the present Timber Resource Review is an improvement over previous ones and that it will be valuable to all interested groups. Before the final draft, if improvements are offered through classification and corrections, they should be used. Comments in the Forest Industries Review indicate the value of the forest survey and the need for keeping it up to date. If we are going to have increased demand for forest products, this need is going to increase.



Cooperation in this review between interested groups was the best to date and should serve as a pattern for further cooperation in the future.

In regard to pulpwood supplies in my state, the cut or harvest has increased nearly 100% in recent years. I believe this has been a good thing for the state and indicates we are growing enough wood to meet this demand by providing good, improved protection against fire and forest pests and better harvesting practices from the standpoint of a future crop. The future looks good to me for the pulpwood industries' wood supply and for foresters, provided we all pull together.

How AFA Sees USFS Review

By LOWELL BESLEY*
American Forestry Assn.
Washington, D.C.

● The American Forestry Association expressed its support for the Timber Resource Review when it was first proposed. Our program for American Forestry recommends review of the nation's forestry situation at periodic intervals of 10 years or less. Such reviews are needed for sound planning of forestry programs and for a public understanding of the place of forests in the general economy.

We are well pleased with this current review. It presents more complete and more accurate data in more usable form than any of its predecessors. Also it points up the tremendous strides in forest management and very especially those in the pulpwood industry during the past decade.

IMPACT ON PUBLIC—This review, when finally published and widely disseminated, is bound to have a tremendously beneficial impact on the public mind. Despite the pulpwood industry's valiant efforts to put its best foot forward in recent years—and with a strong measure of success—there is still a very large segment of the general public which prefers to believe in some of the now outmoded pronouncements of Gifford Pinchot at the turn of the century. This is partly due to the fact that a very articulate group of zealots who sincerely believe themselves to be conservationists have not kept themselves informed of recent developments and are keeping the old dicta alive.

The Timber Resource Review should help to dissipate these charges. As Dr. McArdle says in the foreword: "I believe it will convince the reader that we are not faced with an acute timber shortage in the United States. I earnestly hope that it will also convince you that we face a tremendous challenge if we are to grow enough timber so that our children may enjoy the timber abundance that we ourselves have known."

There are those who would have preferred a more complacent attitude in the report and many others who object to predictions in general and to 45-year predications in particular. Granted that crystal-ball gazing is a precarious business, there is scarcely anyone who does not have to engage in it every day in the normal course of his activities.

The current Review makes available to the reader all the basic data upon which its predictions are made, and leaves each of us free to make his own predictions and interpretations as he sees fit. At the same time it furnishes the non-technical public with interpretations and predictions representing the best thinking of at least one group of experts.

REQUIRE FAVORABLE CLIMATE—Our forest industries require a favorable economic and community climate in which to operate most effectively. We need public understanding and assistance in working out the problems which confront timber growing, harvesting, manufacture and marketing. We want a well-informed public—not a complacent or disinterested one.

Such a public should be alert to what needs to be done, as well as to progress thus far. It should be fully aware of the problems and shortcomings of all forest landowners, including the forest industries, if it is to assist in solving these problems and overcoming these shortcomings. The Timber Resource Review can help to create an atmosphere of public opinion in which forestry and forest industry can prosper.

* Resigned as executive director of AFA recently, to accept position as chairman of woodlands research at Pulp and Paper Research Institute of Canada.

What the South Has to Say

By W. J. BRIDGES, JR.
Union Bag & Paper Corp.
Savannah, Ga.

● I do not intend to quote any of the multitude of statistics reported in the Timber Resource Review to get across the significance of this report to the Southern pulp and paper industry. My approach, instead of dealing in figures, will be to deal in principles involved in the long range wood supply of a region.

Pulpwood, as compared to other commodity drains from our Southern forests, is not the chief use of our forests. Approximately twice as much volume is used for sawlogs as is used for pulpwood in Southern forests. This immediately signals that the amount of forest products that we in the pulpwood industry use cannot be considered separately from the total use of our region's forests. Our industry alone will never determine the growth vs. use relationship of our forests.

So much for the part of total use of our forests for pulpwood.

SMALL LAND OWNERSHIP—How does the industry stand with respect to impact on Southern forestry? By measure of forest land ownership, on the small side, as the industry owns only some 6% of commercial forest lands in the South.

But land ownership and forest use for pulpwood do not signify our true place in Southern forestry.

The importance of our industry on the practice of forestry in the South, and the eventual growth vs. use relationship is completely disproportionate to our land ownerships. Our industry exerts tremendous influence on Southern tree growing. Our staffs of trained and experienced foresters that manage our lands coupled with a host of procurement people plus the hordes of conservation foresters are shaping the composition of timber stands and the minds of men at a rapid pace.

CONTRAST WITH LUMBER INDUSTRY—One very important reason for this happening as it has is because we, as an industry in the South, are

composed of a relatively few companies, each representing a multi-million dollar investment which must and will be protected by raw materials. In contrast to this, the lumber industry is composed of many thousands of smaller enterprises that are not so dependent on long range supply to liquidate plant investment.

We should take very seriously our share of the responsibility for growing more trees in the South. This responsibility can be satisfied by:

(1) Intensification of management of our own timberlands in order to force more timber growth from the soil. This does not come about without expenditures of effort and money. However, it is a blue-chip investment as the repayment is in increased forest growth. The increases in land and stumpage values in the South in the last two years should cause company presidents, vice-presidents, and comptrollers to ask for a complete reappraisal of their forestry programs. Such a reappraisal will reveal that you are paying taxes, protection, and administrative cost to grow some worthless scrub hardwoods on some of the finest pine growing soils.

(2) Secondly, more should be done in the conservation and educational fields to speed the day when most of the smaller landowners have their timberlands productive. I am speaking of the usual conservation services such as the ones the Southern Pulpwood Conservation Association encourages. Here again, a reappraisal by company presidents and comptrollers in light of present day cost of wood and increased number of mills should revise these budgets upward.

Twice, in pointing out responsibilities, I've mentioned that the top echelon in our companies must consider these matters. This wasn't happenstance—it is deliberate. However, the level of management and administration must take these programs in a forceful manner so they will get favorable consideration.

LOCATION OF MORE MILLS—There is one grave responsibility that rests equally on woodlands managers and heads of companies and that is the location of additional pulp mills in the South. The day has passed when we can say, "Come on, build a mill, we have a surplus of wood"—the day has also passed when we can scan a map and allow, "There's no mill within 'X' miles of here so this is a good place for a mill."

Virtually all of the South has a market for its pulpwood and from here on out, location of new mills should be decided first on the basis of availability of pulpwood, with all other considerations such as ample inexpensive water supply, effluent disposal, plentiful labor, and proximity of markets relegated as secondary considerations.

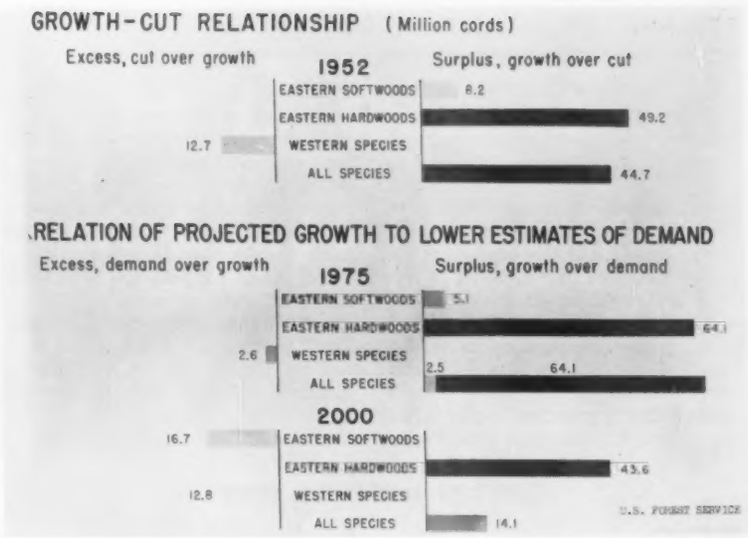
To sum up the significance of the Timber Resource Review on Southern industry, it has served to reaffirm that there is presently no surplus of pulpwood in the South.

We need to do more to grow more on our own land.

We need to beef-up our already good conservation activities aimed at helping others grow more wood.

We must be very cautious about further expansion of the industry in the South.

We have all of the God-given attributes needed for growing more wood—good soil, ample rainfall, long growing season, suitable species. Temperance is needed in any further expansion if we are to use wisely our inheritance.



North Asks More Accuracy

By D. B. DEMERITT
Dead River Co.
Bangor, Me.

● At the outset I would state that I believe that the Forest Service has done a creditable job in producing a set of figures and estimates. It has always been my contention, however, that the government would have been wiser and our information would have been more accurate if the same money were put into completion of the nationwide forest survey as authorized by the McNary-McSweeney Act of 1927.

The figures now available show that the situation is better in the Northern forest area from the standpoint of growth vs. drain as is the case almost everywhere, and that the pulp and paper industry apparently is well supplied with timber; even better than the lumber industry.

Dr. McArdle, the Chief of the Forest Service, in his presentation of a summary of this material at Portland, Ore., in Oct. 1955, emphasized that "all generalizations are dangerous." We all know that this is particularly so in connection with such a report as this one.

It would appear however that the paper industry in this area has little to worry about on its own holdings; that is, the TRR figures would indicate that this industry is doing a good job in managing its own lands. Only a relatively few acres need planting as compared to other regions. Protection is relatively well in hand but needs strengthening—especially in insect and disease control.

MAIN PROBLEMS—The main problems as I see it, can be summed up in about two or three categories:

(1) Forest management practices need to be improved in the smaller holdings, including farm woodlots. This has long been recognized by APA, but it is not a simple problem. It can only be solved over a period of years by real honest effort by all concerned.

(2) While the timber supply appears adequate from the TRR figures, it would be a mistake for industry to sit back and be complacent about it. The only way to produce timber at a low price is to have a lot of it to meet the demand at any given time. It would appear that this demand is going to continue. Improvement of forest practices on our own land should not be allowed to stand still, but should tend to keep pace with the demand. There is plenty of room for improvement still.

(3) Forest protection needs to be strengthened. Forest fires periodically get loose, so we must not let up on this phase of the work. It is in insect and disease control that we are weakest, probably because the inroads of bugs and decay are not as phenomenal to observe as is fire. Nevertheless, the inroads from these pests is possibly greater than from fire.

(4) Again I repeat, just because the TRR says the situation is good, let us not be complacent, nor on the other hand be alarmed. Let us continue to try for more and more accurate appraisals of our timber inventory, growth and drain as provided by the Act of 1927 and keep it up to date.

TRR Impact for Lake States

By F. N. FIXMER
Mosinee Paper Mills Co.
Mosinee, Wis.

● In the process of studying the Timber Resource Review and the many expert opinions concerning it, and while trying to absorb some of the numerous statistical data quoted, I was reminded of the story about little Johnnie, who came home from school one day, proudly clutching a picture book in his hand, and announced that he had won the book as a prize.

"What did you do to win that prize?" asked his Mother. "Well," said Johnnie, "teacher asked everybody how many legs does an ostrich have and I said three!" "But," protested his Mother, "an ostrich only has two legs!" "Yes, I know that now," replied Johnnie, "but I came the closest!"

In all this debate about the reliability and accuracy of Timber Resource Review data, just who is the "closest" only time will tell. But whether the Forest Service proves to be reasonably correct in the mass of data that resulted from three years of field work and analysis, or whether its critics are closer to the truth, is of relatively little importance.

TRENDS, NOT FIGURES—The really important accomplishment, in my opinion, was that a much-needed inventory—or "stock-taking," if you prefer—was achieved, and that some very definite, specific trends were disclosed which we could only guess about before.

For example, it is not of so much importance to most of us—except perhaps to statisticians—whether the numerical fact that 1,391,000 acres have been planted in the Lake States (through 1952) is accurate within 2, 5, 10, or 20%. It is highly significant, though, to have the Timber Resource Review disclose that even though this accomplishment represents over ¼ of the total planted area in the United States, it still is only 15% of the total plantable area in the Lake States.

Still more significant is the revelation that due to the rate at which reforestation efforts have accelerated in recent years, and further due to an increasing rate of natural restocking resulting from various factors, very little plantable area will remain by the end of the present century.

Conclusions such as these, regardless of the relative accuracy of the individual figures from which they were derived, are basic to many policy decisions affecting forest management policy. They are now a matter of record for future generations of foresters to praise or condemn according to their merit.

Of special interest to the pulp and paper industry in the Lake States are the TRR findings with regard to such factors affecting the future supply of pulpwood as: (1) Present productivity of forest land; (2) Protection from destructive agencies; (3) Improved utilization of all species.

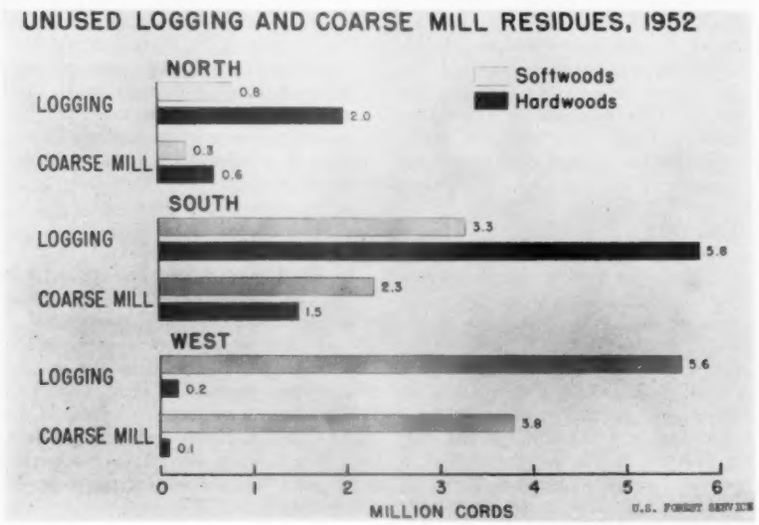
Again, we should not be concerned with detailed statistical data, but with trends that are revealed by them.

HALF LAND WELL STOCKED—With regard to the present productivity of forest lands in the Lake States, it should be cause for considerable concern on the part of forest industries that only one-half of the commercial forest land in the region can be classed as being well-stocked. This is far below the average for both the northern portion of the United States and for the country as a whole.

Foresters of the region have a tremendous task ahead of them in improving the productivity of over 26,000,000 acres of public and private forest lands which are now classified as being poorly-stocked or non-stocked.

On the other hand, Lake States forest industries can enjoy considerable satisfaction in the knowledge that nearly ¾ of its own forest land can be rated as highly productive. Our pulpwood industry can take particular pride in the fact that approximately 84% of its ownership merits classification in the higher levels of productivity.

Another fact long-suspected, but only now proven by TRR, is that farm lands and other privately-owned lands



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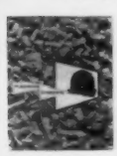

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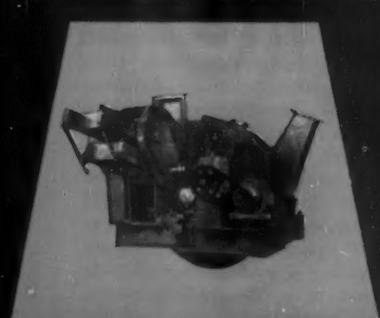
MURCO 12-Knife High Speed Wastewood Chipper designed along the general lines of the standard MURCO Pulpwood Chipper, ruggedly built and is used where high production is required to produce a high-quality chip . . . made in disc diameters 56", 64", and 73".



MURCO Mechanical Feed 4-Knife Wastewood Chipper with 75" disc diameter . . . Angle feed for overhead processing of slabs and edgings for chipping process at floor level . . . also available in horizontal type mechanical feed where head room is at a premium.

in the smaller size classes of ownership have a large proportion of their operating areas in a condition of low-productivity. This is true not only in the Lake States, but also applies throughout the country.

The situation justifies the increasing attention in recent years which has been given to programs designed to improve farm woodlot management. In the Lake States, increased efforts of recent years in promoting conservation education, ideas like the tree farm movement, and the work of organizations like Trees for Tomorrow in Wisconsin, will undoubtedly result in a much improved forest situation among small private owners by the time the next resource inventory is taken.

DESTRUCTIVE AGENCIES—A forest condition which has long been suspected but never adequately assessed is that concerning the effect of fire, insect, disease, and other destructive agencies on the potential growth of Lake States forests. Wood-using industries of our region cannot stand idly by while fire continues to destroy 4 million cu. ft. of wood each year, insects consume 170 million cu. ft., disease deteriorates 674 million cu. ft. and other agencies, such as windstorms and animals, further destroy 992 million cu. ft. of growing stock each year.

The impact of these destructive factors on sawtimber reserves in the Lake States is apparently even more enormous, varying from two to three times greater. Losses such as these must be reduced if the ever-increasing demand for wood products is to be satisfied. Only when effective action is taken to minimize these losses will we be able to improve further the favorable growth-drain ratio shown by the present Timber Resource Review report.

Favorable evidence of a good start in that direction can be noted in the Lake States region where many publicly-owned forests have increased their cutting budgets in recent years to harvest greater volumes of mature and over-mature timber in which losses from insects, disease, and windstorms have been exceptionally high.

The passage of a Forest Pest Control Law in Wisconsin in 1955 marked another progressive step in the fight against insects and disease by providing a cost-sharing plan in the event of epidemics. Minnesota and Michigan have also placed greater emphasis on protective measures to guard their timber resources against further depletion by these forces.

OVERLOOK HARDWOOD USE—The Timber Resource Review has made one generalization, however, to which the Lake States forest industries could take exception on the basis of their regional experience. Chapter III of TRR concludes that "hardwood volume is accumulating and the annual growth of hardwood is increasing," but "the excess of annual growth over cut for hardwoods is of little consequence when there is so little evidence that a more abundant supply will bring forth commensurate increases in demand."

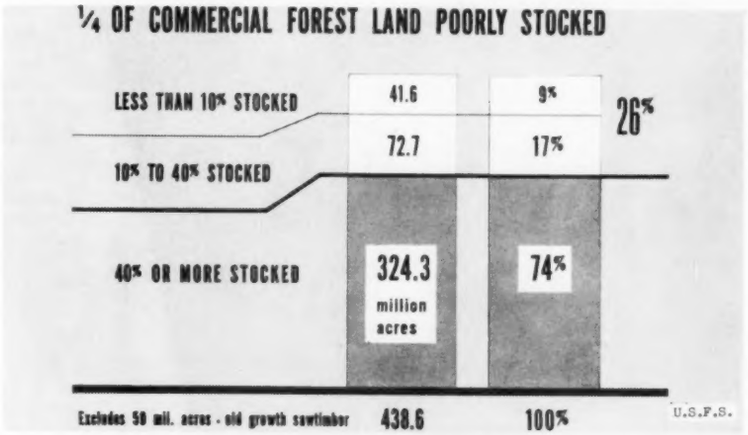
Yet, a combined report of the Forest Service and Commodity Stabilization Service for 1955 wherein they review the demand and price situation for forest products contradicts the foregoing and maintains that "consumption of hardwoods has been expanding . . ." and that "this has been particularly true in the North."

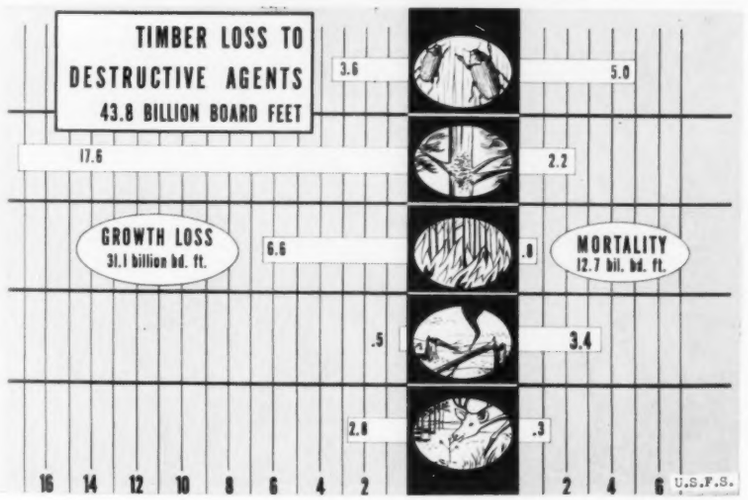
Furthermore, says this report, "A future trend toward the use of more hardwood is expected as a result of the new pulping processes suitable for hardwoods, the higher yields obtainable per cord of wood and increasing competition for the available softwood timber supplies."

In the Lake States, it is a well-known fact that aspen has become the leading pulpwood species being used in recent years, with other hardwoods being used more extensively with each successive year.

Many foresters in the Lake States have contended for some time that the day is rapidly approaching when Lake States pulp mills will become almost completely independent of wood sources outside the region because of this increasing use of hardwoods. Evidence of this possibility is readily found in statistical trends which show the tremendous increases in hardwood utilization during the past ten years.

With an acceleration of this trend in the near future, with more intensive management practices by public and private agencies, with greater protection and improved utilization standards, there can be no doubt that Lake States timber resources will continue to show periodic gains in available volume and growth rates with each successive Timber Resource Review that may be made in the future.





Blame FS for Losses in West

By C. V. SAHLIN
Puget Sound Pulp & Timber Co.
Bellingham, Wash.

● I do not represent Western industry in any official capacity and am speaking only as one who is very interested in the timber resources of the Douglas Fir Region through my work and many contacts with Western timber industry people.

I would like to be in the position of the other industry representatives from regions where the timber and pulpwood resources show they are growing more wood than they are using. The West does not yet enjoy this enviable position.

I will not attempt to criticize or appraise the Timber Resource Review but would like to highlight some of the forest facts as set forth in the Review and some problems and conditions that many of us in Western forest industry feel are important to our region but which were not particularly brought out in the Review.

My comments pertain to the area of Western Oregon and Washington known as the Douglas Fir Region and is the section of the country with which I am, in some degree, familiar and where the great pulp mills of the West are located.

OLD-GROWTH ECONOMY—In the Douglas Fir Region, we have 25 million acres of commercial forest land, 30% of which supports mainly old-growth fir, hemlock and cedar timber. This is 36% of the total softwood saw timber stands of the nation. We are still on an old-growth saw-log economy and will continue to be for the next fifty years.

This region cuts annually ⅓ of this country's softwood lumber, ¾ of its conifer plywood and 16% of its pulp timber, all from about 5% of the nation's forest land.

The tables from the Timber Resource Review indicate that our growth is only half that of our cut, which might appear to be an unhealthy condition but which, in fact, is to be expected during this period of converting the old-growth forest to young growing stands.

Many of the practical foresters from our section of the country believe that we can obtain a much more favorable growth-cut relationship if we cut heavier on our over-mature stands. The Review admits that we are losing substantial volume each year from these stands rather than appreciably increasing volume, which would be the case if the lands were converted to productive young growing trees.

We are now going through the stage which took place in other sections of the country many years ago of converting from old-growth to vigorous growing stock. The potential growth of the lands now occupied by old-growth stands that have stopped growing amounts to 2 and ½ billion bd. ft. per year.

This quantity is one-fifth of the Douglas Fir Region's present average annual cut of approximately 12 billion ft.

UNSALVAGED MORTALITY—The Timber Resource Review estimates the total unsalvaged mortality in our region due to insects, disease, fire and wind damage amounts to nearly 2 billion ft. annually. An additional volume of about 1.5 billion ft. of growth is lost annually through these destructive agents.

According to TRR, the growth impact, which is defined as the growth loss plus the mortality, is more than the net growth in the Douglas Fir Region and is one-half of the yearly volume of timber cut. Nearly all of this loss takes place in our old-growth timber stands and can be attributed primarily to their inaccessibility and over-mature condition.

We are making good progress towards salvaging large portions of this loss and the problem will only exist until the old-growth timber has been cut. In total, our old-growth timber stands are actually costing this region about 6 billion bd. ft. of net growth per year, which is one-half of our annual cut and equal to our deficit of cut over growth.

We can improve our position through better management of our second growth lands, more utilization of forest and mill residues and improved control of insects, disease and fire.

SMALL CUT ON PUBLIC LANDS—Public ownership in the area consists of 55% of the total volume, yet it contributes only 20% to our annual cut. The Forest Service controls the large portion of this public over-ripe timber.

Through their policy of selling for industry use only their allowable cut and whereby only an average of 70% of this allowable cut has been made available for sale the past five years, there is created a false scarcity of timber.

This brings high stumpage prices at competitive bidding and thereby encourages liquidation and accelerated cutting of our young second growth that is just now reaching its best productive age.

The soundness of Forest Service policy in attempting to keep these over-mature forests for another 100 years or more in face of the great losses they are sustaining annually is questionable. Under such a program, coupled with the 7 billion ft. of merchantable timber in the region set aside as wilderness and wild areas and the proposed additional 8 billion for the same purpose as being advocated by the conservationists, plus the great volumes locked up in the West's huge national parks, it is no wonder that we in this area are feeling the pinch for timber.

The tremendous volumes of fine, merchantable timber in parks and wilderness areas that are withdrawn from use are not, as far as we can find, included in the West's volume in the Timber Resource Review. Industry cannot even buy the dead and windthrown trees in these areas because top policy makers from the East say Nature meant that they should die and blow down. Such waste is inexcusable.

In conclusion, many of us in the Western region feel that under good forest management the potential of our forest lands is enough to sustain the present annual cut if the vast areas of public timber are allowed to contribute a greater share on a sound forestry basis.

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1. Side plates are of abrasion resistant high strength steel, securely fused to moldboard and box sections by low-hydrogen welding. They prevent load spillage, allow you to carry larger loads. Standard on all International bulldozer blades.

2. Push arms are sturdily constructed of box sections. Side plates are mill-rolled with integral back-up bars to support top and bottom plates. Machine welding guarantees uniformity of weld.

3. Headless pins, locked by eye bolts, secure struts to blade. For removal, pins can be driven out in either direction. On hydraulic blades, all control linkage is connected to the blade through self-aligning bearings.

4. Entire perimeter of blade is backed by heavy box channels solidly fused to moldboard. With this type of construction moldboard, box channels, and welds flex freely to prevent weld failure.

5. Spillboard is wide and high to prevent spillage over top of blade. Note that it is curved to match the contour of the moldboard, thus aiding boiling action. Width of moldboard allows you to carry full load for which the blade was intended.

6. Moldboard is formed from a single sheet of low-alloy, high-strength steel. International blade is shaped to perfect curvature in a special forming machine to assure uniform strength and stress resistance over entire area.

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These new blades are rigidly supported around the edges by box sections to give the blade strength but also permit the moldboard to "breathe" under load stresses. New automatic welding processes guarantee that the welds in International blades will hold up under *any kind of job conditions.*

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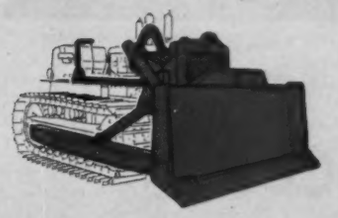
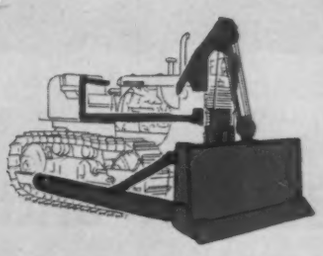
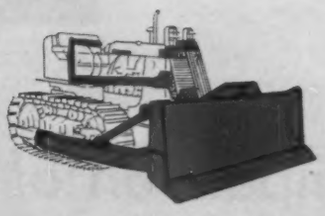
Bonus-Powered International crawlers



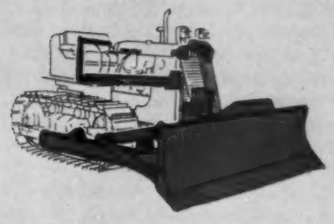
Direct Lift Hydraulic Bulldozer
Operates off front-mounted, gear-driven pump which gives fast blade action. Self-aligning bearings prevent binding of linkage.



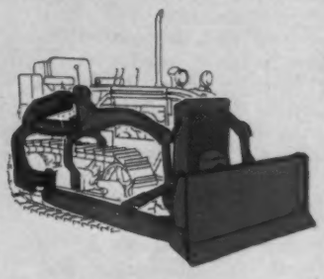
High-Gantry Cable Bulldozer
Operates off either front or rear-mounted International cable control unit. Available for TD-24, TD-18, and TD-14 tractors.



Low-Gantry Cable Bulldozer
Operates off either front or rear-mounted International cable control units. Available for TD-24, TD-18, and TD-14 tractors.



Hydraulic or Cable Bullgrader
Operates off high or low gantry, front or rear cable controls on TD-24, TD-18, and TD-14 tractors. Hydraulic bullgrader also for TD-9, TD-6, and T-6 tractors.



Track Frame Mounted Bulldozer—Distributes the load evenly over the length of the tracks. Available only for TD-9, TD-6, and T-6 tractors. Bullgrader also available.

International Drott "4-in-1"
Newest of International Drott loaders. Combines Skid-Shovel, Bull-clam, clamshell, and bulldozer in one unit. Available for TD-14, TD-9, and TD-6 tractors.

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Wood Preparation, Hauling, and Handling

(L to r) RAY MALECKI, Union Bag & Paper Corp., Panel Chairman; R. O. "GUS" GUSTAFSON, Westvaco Experimental Forest; FRANK E. PEARSON, JR., Eastern Pulp Wood Co.; E. F. "HATCH" O'HARA, Armstrong Forest Co.; and JIM HOLEKAMP, American Pulpwood Assn.

Comparison of Barkers and Costs

A comprehensive review of barking developments, with illustrations and procedures for computing operating costs

By J. A. HOLEKAMP
American Pulpwood Assn.
Sylacauga, Ala.

• An ever-increasing demand for pulp and paper products points up a need for tapping new and additional sources of wood fiber and stepping up production per man day. In the first instance, the two spotlighted subjects of "getting more out of each tree cut" and "utilizing a wider variety of hardwood species" are receiving much review and close attention by many in the pulpwood industry today.

Making available a substantial quantity of wood fiber from these new supply sources hinges on successes in the field of bark removal. In working toward this end, the pulpwood industry is discovering new techniques of operation that hold promise of helping the industry increase production per man day.

Each new debarker development brings on numerous inquiries, many of them expressing a desire for values reflecting some idea of operating cost estimates. For that reason, this paper not only covers news of recent debarker developments, but provides illustrations and sample procedures for computing operating costs of debarker operations.

RECENT NEWS ON LOG DEBARKERS—(1) THE CAMBIO 26 IN. is to be marketed by Soderhamn Machine Manufacturing Co. at Talladega, Ala. This make of debarker completely replaces Soderhamn's Andersson debarkers which no longer are being manufactured.

Principle of Bark Removal: Cambium-shear principle employing debarking tools extending centerwise from a rotary ring by force of thick rubber tension bands. **Feed:** Fully automatic, log-to-log feed accomplished by means of powered, chuck-type feed rolls. **Price:** $27,300 at plant. **Horsepower:** 60.

Comments: A Cambio 21 in. debarker is also available for smaller logs. Substantial numbers of this company's Andersson debarkers have been installed in sawmills converting chips from pine sawmill waste, most of these installations being in the South. The Cambio 26 in. machine is to serve as an improved model to the former. The Cambio 26 in., like the Andersson, will probably be most favored among sawmills with daily production capacities ranging from 35 M bd. ft. and up.

The Cambio shows promise for debarking of hardwood logs also. Cambio manufacture for the first half of 1956, at least, will be principally in Sweden. Plans are underway now for manufacture in the States.

(2) **NICHOLSON ROTO BARKER:** Available from Nicholson Manufacturing Co., Seattle, Wash.

Principle of Bark Removal: Cambium-shear principle employing debarking tools extending centerwise from a rotary ring by force of pneumatic pressure. **Feed:** Log-to-log feed requiring the services of an operator and employing heavy rolls which securely press each log against the spur-toothed infeed and outfeed conveyors. A model debarker with automatic feed is being developed. **Price:** Approximately $33,500 for the 30 in. model, and $23,000 for 26 in. model (f.o.b. Wilco Machine Works, Inc., Memphis, Tenn.) **Horsepower:** 80 (30 in. model).

Comments: The 30 in. debarker is operating in numerous Southern sawmills capable of a daily production capacity of 35 M bd. ft. and up. Installations of still larger models are also on the West Coast. This is a heavy and sturdily built barker. Most sawmills employing this debarker, in the South, debark pine logs. The new 26 in. machine enables debarking of pine and hardwood bolts as short as 5 ft. in length.

(3) **HURRICANE LOG DEBARKER:** Available from Morriss Engineering Co. of St. Louis, Mo.

Principle of Bark Removal: Rotary cutterhead equipped for finger-tip control over depth of cut. **Feed:** Requires an operator. Each log is spiralled past the debarking head by pairs of bull wheels which can be turned on their vertical axis. This gives operator control over rate of feed through debarking chamber. **Price:** Approximately $25,000 f.o.b. plant, Bossier City, La. **Horsepower:** 60.

Comments: Especially well suited for a sawmill equipped with whole log sash gang mill. Can debark both hardwoods and softwoods. Several installations are already operating in the South in sawmills with daily production capacities of 20 to 45 M bd. ft.

(4) **SUMNER'S MECHANICAL DEBARKER:** Manufactured by Sumner Iron Works, Everett, Wash.

Principle of Bark Removal: Rosser-head principle with bark removed by the combined action of 4 rotary rosser heads which break up and remove most of the bark, and 2 rotary brushes which give the log final polish. **Feed:** Requires an operator. A log-to-log feed is possible, each log spiralled through the debarking chamber. **Price:** Approximately $58,000 at plant. **Horsepower:** 90.

Comments: Three of these debarkers are now operating at a West Coast pulp mill debarking alder logs. The prototype machine debarks softwood logs at a large Western sawmill.

(5) **SODERHAMN D-3 LOG DEBARKER:** Manufactured by Soderhamn Machine Mfg. Co., Talladega, Ala.

Principle of Bark Removal: Rotary chain flail mounted on a travelling dolly. **Feed:** Requires an operator. Each log is rotated as the dolly with rotary flail travels the length of the log. **Price:** $16,900 at plant. **Horsepower:** 35.

Comments: Many of these debarkers have found their way into Southern sawmills producing 20 to 35 M bd. ft. of pine lumber per day.

(6) **JACKSON MECHANICAL LOG DEBARKER:** Manufactured by Jackson Industries, Veneer Div., Birmingham, Ala.

Principle of Bark Removal: Rotary rosser head mounted on a travelling overhead dolly pushed by hand. **Feed:** Requires an operator who manually rolls logs on and off bull wheels. Location of debarker is on the log deck feeding the log carriage. Bull wheels rotate the log as the operator applies the rosser head and pushes it the length of the turning log. **Price:** Approximately $7,500 f.o.b. plant. **Horsepower:** 17.

Comments: This may well be the small mill log debarker for which there is much demand. Production per hour should average 1,500 bd. ft. with typical Southern pine log sizes. To date only one pilot model has been manufactured.

Extremely simple design, few working parts, heavy construction, and good bark removal results provide optimism for a stepped-up program of utilizing waste from the small sawmiller, whether the logs be hardwood or softwood. This development holds promise of small sawmills supplying a chip concentration yard with bark-free slabs and edgings, in addition to the possibility of supplying chips by some.

SLAB DEBARKERS—(1) **WATKINS SLAB DEBARKERS:** Manufactured by Sumter Manufacturing Co., York, Ala.

Principle of Bark Removal: Rotary chain flail with one debarking head for slabs and the other for edgings (large model). **Feed:** Operator controls rate of feed by means of clutch which transmits power to spurred feed rolls. Heavy pressure rolls hold down slabs and edgings. **Production Rate:** With large machine, 2½ units per hour. With small machine, 1 unit per hour. (A unit represents 5,000 lbs. of green pine chips.) **Price:** Large machine, $8,250 at plant. Small machine, approximately $5,000 at plant. **Horsepower:** Large, 20. Small, 15.

Comments: N. F. Watkins of York, Ala., is operating two of these prototype debarkers at a chip concentration yard located on a rail siding. Watkins is inventor and manufacturer of this debarker. One of his units is now undergoing extensive testing at a large sawmill already equipped with complete log debarking, chipping, and chip loading equipment. It is the intention of this sawmiller to buy slabs and edgings from nearby small sawmills and to increase the daily chip production capacity of his chip conversion plant.

(2) **HOSMER SLAB DEBARKER:** Manufactured by Hosmer Machine and Lumber Co., of Contoocook, N. H.

Principle of Bark Removal: Bark is removed from slabs and edgings by a single rotary hammer flail. **Feed:** Slabs and edgings are carried through the debarking chamber by means of a wide rubber belt. Heavy pressure rolls press this material firmly against the belt. Operation is fully automatic with a change of feed rate possible only by changing size of drive pulleys. **Rate of Production:** 5 units per hour is considered tops; 2 units per hour seems a more representative figure. **Price:** Model S-4, $9,800; Model S-3, $7,800. **Horsepower:** 21½ on the S-4 model, and 16½ on the S-3.

Comments: Several of these debarkers are now in the field. One installation in the South is at a small sawmill cutting at a daily capacity of 16,000 bd. ft. Debarked slabs and edgings are transported by a truck-trailer unit to a chip conversion plant already installed at a large sawmill. There are also installations in the Northeast and in Eastern Canada.

(3) **JACKSON HYDRAULIC SLAB DEBARKER:** Manufactured by Jack-

THREE OF NEW DEBARKERS. Left, Nicholson Roto Barker utilizing cambium-shear principle employing debarking tools extending centerwise from rotary ring by force of pneumatic pressure. Middle, Soderhamn Cambio Barker, also cambium-shear type, with debarking tools extending centerwise from rotary ring by force of thick rubber tension bands. Right, Watkins Slab Debarker, using rotary chain flail, with one debarking head for slabs and other for edgings.

FIGURE I - WORK SHEET, MACHINE RATE

FIG. I

Make _____ Model _____ Manufacturer _____

I. BASIC INFORMATION _____

A. Initial delivered cost of debarker (with power) $_____

B. Initial cost of accessory equipment:

(a) Additional handling facilities (logs, slabs, pulpwood) $_____

(b) Chip conveyors or conveyors _____

(c) Chipper (for log and slab debarkers only) _____

(d) Screen (for log and slab debarkers only) _____

(e) Chip loading equipment (RR cars) (for log and slab debarkers only) _____

(f) Cost of installation _____

TOTAL $_____

C. Total Equipment Cost $_____

D. Estimated average plant and equipment life

(a) Years* _____

(b) Hours* _____

E. Average production rates (use cords, chip units, or M bd. ft.)

(a) Per Year* _____

(b) Per Day* _____

(c) Per Hour* _____

II. FIXED COSTS (costs which are incurred whether or not equipment operates)

A. Depreciation charges

Total equipment cost: $ _____ / Total estimated life: _____ hrs. = _____ / hr.

B. Charge for interest, taxes, and insurance

Average annual investment: $ _____ / Hrs. operated per year: _____ x 10% _____ / hr.[1]

C. Total Fixed Charges

_____ / M bd. ft.
_____ / unit of chips
_____ / cord
_____ / hr.

III. OPERATING COSTS (costs incurred if equipment is used)

A. Repairs and upkeep (include all cost of repair, labor, and parts)

*Cost per year: $ _____ / Hours operated per yr. _____ = _____ / hr.

B. Maintenance (routine lubrication and adjustment)

_____ *Men (_____ *hrs. worked/day x hourly labor cost 1.09** / _____ total machine hrs./day _____ / hr.

C. Operating labor

_____ *No. Men (_____ *hrs. worked/day x hourly labor cost 1.09** / _____ total machine hrs./day _____ / hr.

D. Operating supplies and power (grease, oil, electricity, etc.) _____ / hr.

E. Total Operating Cost

_____ / hr.
_____ / cord
_____ / M bd. ft.
_____ / unit of chips

FIGURE II - ILLUSTRATION: COST ESTIMATES FOR LOG DEBARKERS

FIG. II

(Waste converted to chips)

		DEBARKER TYPE				
		Cambium Shear		Cutterhead and flail type		Rosser Head
		#1	#2	#3	#4	#5
1)	Debarker	$45,000	$30,000	$25,000	$16,000	$ 7,000
2)	Cost of Accessories	25,800[3]	25,800[3]	25,800[3]	25,800[3]	18,000[4]
3)	Total Investment	70,800	55,800	50,800	41,800	25,000
4)	Estimated equipment life (hrs.)	10,000[2]	10,000[2]	10,000[2]	10,000[2]	8,000[5]
5)	Production per year - M bd. ft.	15,000	15,000	8,000	8,000	2,400
	per year - units[3]	9,000	9,000	5,000	5,000	1,440
	per hour - units[3]	4.5	4.5	2.5	2.5	.9
6)	Units per man day	18	18	10	10	3 to 7
7)	Total Fixed Costs per Unit (see Figure I)	$2.02	$1.61	$2.64	$2.17	$4.50
8)	Total Operating Costs per Unit (see Figure I)	---------- not recorded ----------				
9)	Total Estimated Cost per Unit of Chips f.o.b.	$3.50 to $5.00[6]		$5.00 to $6.00[6]		$8.00 to $10.00[6]

son Industries, Veneer Div., Birmingham, Ala.

Principle of Bark Removal: A single hydraulic jet discharging water at a rate of 600 gpm (maximum) at a pressure of more than 1,200 psi. **Feed:** Slabs are carried beneath the debarking jet by means of powered rolls. Pressure hold-down rolls are not normally used. A centering device is employed to guide slab directly beneath the jet. **Price:** $37,500 at plant with power and pumps. **Production Rate:** 5 to 7 units per hour. **Horsepower:** Approximately 300.

Comments: One Southern pulp mill now has a successful installation of this debarker at their mill. Rough pine slabs are purchased from numerous local small sawmills within trucking radius of this pulp mill. Eventually it is hoped that as much as 500 cords of slabs per week can be processed. Some consideration is now being given to supplying a portion of the mill's slab requirements by means of rail transport.

PULPWOOD DEBARKERS — (1) CAMBIO 8, 14, AND 21 IN. PULPWOOD DEBARKERS: Manufactured by Soderhamn Machine Mfg. Co., of Talladega, Ala.

Principle of Bark Removal: (See description under Cambio 26 in.) **Feed:** (See description under Cambio 26 in.) **Estimated Production Rate in Cords:** 8 in. is 5 to 10; 14 in. is 7 to 15; and 21 in. is 10 to 20 per hour (depending upon diameter and length of sticks being processed and handling facilities on infeed and outfeed end of debarkers). **Price:** 8 in. is $14,800; 14 in. is $16,900; 21 in. is $22,100 at plant. **Horsepower:** 8 in. is 20; 14 in. is 35; 21 in. is 45.

Comments: It has been stated that a substantial number of these debarkers will be operating in this country by the end of July, 1956. This debarker provides optimism for those who see merit in the debarking of pulpwood on a stick-by-stick feed.

NOTES AND EXPLANATIONS

Figure I:

* **Note:** Furnish this information using estimated or actual values. Denote estimated values by symbol "E".

** Charge for workmen's unemployment and accident compensation insurance, social security, etc.

[1] **Note:** Use this formula:

$$\text{Average investment} = \frac{\text{Total initial cost (life plus 1)}}{2 \times \text{equipment life}}$$

The 10% is the estimated total charge to be made.

Figure II:

[1] Breakdown: Log handling, $2,100; conveyors, $4,500; chipper, $12,900; screen, $2,300; chip handling, $2,000; other installation costs, $2,000. (sawmills cated on railroad siding)

[2] 8 hrs. a day; 40 hrs. a week; 50 weeks a year; five years.

[3] Unit = 5,000 lbs. green pine chips (selected only for use with this illustration)

[4] Breakdown: Chipper, $12,900; screen, $2,300; chip loading, $2,000; log handling, $800 (sawmills located on railroad siding)

[5] 8 hrs. a day; 40 hrs. a week; 40 weeks a year; five years

[6] Plus margin for profit and risk to sawmiller

(2) **IMPCO PULPWOOD DEBARKER:** Manufactured by Improved Machinery, Inc., Nashua, N. H.

Principle of Bark Removal: Cambium-shear principle employing debarking tools which extend centerwise from a rotary ring by the force of helical springs. **Feed:** Recent information indicates that new improved models will permit a continuous stick-to-stick feed of pulpwood bolts or logs through the debarking chamber. New models can debark pulpwood bolts and logs varying in diameter from 4 up to 18 in., and in length from 8 to 30 ft. Operation is fully automatic. **Production Rate:** 5 to 7 cords per hour. **Price:** (No price yet stated.)

Comments: This debarker is similar in many ways to the Cambio design. Design changes will be seen in newer models. Those Impco debarkers now in operation in the Lake States, Appalachian, and Northeastern areas weigh approximately 20,000 lbs. each as compared to the Cambio 14 in. which weighs 3,500 lbs., and the Cambio 21 in. which weighs 14,000 lbs.

MAKING COST ESTIMATES—Basic information was collected by asking manufacturers and some actual users of these new debarkers voluntarily to supply representative cost and operational estimates as outlined in the Work Sheet under Figure No. 1. Further computations were then made and the results placed in composite form. In this way, identity of any specific operation or make of equipment no longer exists.

It is cautioned that the cost values in this report, at best, can be classified only as values based heavily on estimates. In several instances it was

NOTES AND EXPLANATIONS

Figure III:

Example: If chips are purchased at $13 f.o.b. car, the operator of a sawmill producing as little as 4 million bd. ft. of lumber annually may consider this venture as being profitable to him.

[1] In units which, for use with this illustration only, are 5,000 lbs. of green pine chips.

[2] Plus 20% for profit and risk

[3] M bd. ft.

Figure IV:

[1] Under Column (1), include conveyors and peeled slab racks.
Under Column (2), include lift truck, conveyors, chipper, screen, and chip loading system.
Under Column (3), include lift truck, conveyors, slab storage ramp; no chipper.

[2] 8 hrs. a day; 40 hrs. a week; 50 weeks a year; 5 years

[3] Unit = 5,000 lbs. of green pine chips (selected only for use with this illustration)

[4] Plus margin for profit and risk to sawmiller.

[5] Plus margin for profit and risk to concentration yard owner, if installation is not owned by pulpmill.

Figure V:

[1] The three principal variables in calculating an estimate of this kind are: (1) Machine production per year in units, (2) Useful life of equipment, and (3) Annual average cost of repair and upkeep. The above estimate allows $5,400 per year for repair and upkeep. Whether this is a reasonable cost figure right now seems to be anyone's guess. Perhaps the less expensive debarker will cost more than $5,400 a year to keep it in operation producing 10,000 cords annually for 5 years. Maybe, instead, some will find a $1,000 or a lesser figure to be more reasonable.

FIG. III

FIGURE III - ILLUSTRATION: ESTIMATING MINIMUM ANNUAL LUMBER PRODUCTION FOR SUPPORT OF COMPLETE DEBARKER, CHIPPER, CHIP HANDLING INSTALLATION

Conditions:

(1) $45,000 maximum equipment investment

(2) Operating costs vary inversely with changing hourly production rate

(3) Sawmill operates a total of 2,000 hours per year

Hourly Production of Chips [1]	Total Production Cost per Unit of Chips [2]	Annual Lumber Production [3]
.5	$	1660
.75	18.75	2500
1.00	15.08	3340
1.25	12.65	4160
1.50	10.55	5000
1.75	9.04	5820
2.00	7.90	6660
2.25	7.04	7500
2.50	6.33	8340
2.75	5.75	9160
3.00	5.28	10000

FIG. IV

FIGURE IV - ILLUSTRATION: COST ESTIMATES FOR SLAB DEBARKERS

	(1) Sawmill Installation	(2) Concentration Yard	(3) Pulpmill Installation
1) Debarker Cost	$10,000	$ 8,000	$37,000
2) Estimated cost of accessory equipmt.[4]	$ 3,000	$25,000	$35,000
3) Total investment	$13,000	$33,000	$72,000
4) Estimated equipment life (hrs.)[2]	10,000	10,000	10,000
5) Production in units [3] per year	2,000	4,000	10,000 plus
per hour	1	2	5
6) Units per man day	3 - 4	3 - 4	6.7 - 8
7) Total fixed costs (see Fig. I)	1.69	2.17	1.87
8) Total operating costs (Fig. I)	---------- not recorded ----------		
9) Total estimated cost per unit	$3.50-$4.50 (peeled slabs and edgings)	$5 - $6 (chips)	$3.50-$4.50 (peeled slabs only)
10) Estimated handling cost	0.25	----	----
11) Estimated purchase price, rough material (plus or minus)	----	$5.00 (slabs & edgings)	$7.00 (slabs only)
12) Estimated transportation cost (plus or minus)	$3.50	----	----
13) Additional estimated cost of chipping & handling (plus or minus)	$ .50	----	$ .25
14) Estimated freight rates (plus or minus)	$2.00	$2.00	----
15) Estimated unloading cost at pulp mill (plus or minus)	$ .50	$ .50	----
16) Total estimated cost at pulp mill (chips)	$10.25-$11.25	$12.50-13.50	$10.75-$11.75

FIG. V

FIGURE V - ILLUSTRATION: COST ESTIMATES FOR PULPWOOD DEBARKERS INCORPORATING CAMBIUM SHEAR PRINCIPLE OF BARK REMOVAL

Conditions: (a) Life of equipment: 5 yrs. or a total of 10,000 hrs.
(b) Average production per hour - 5 cords
(c) All installations operate under similar conditions
(d) All installations at mill where crane, etc., are already available.

	#1	#2	#3
1) Debarker Cost	$34,000	$24,400	$18,200
2) Cost of Accessories (conveyors & deck)	6,000	6,000	6,000
3) Installation Cost	800	800	800
4) Total Investment	40,800	31,200	25,000
5) Production per year	10,000 cds.	10,000 cds.	10,000 cds.
6) Total Fixed Costs (see Fig. I)	$1.06/cd.	$0.81/cd.	$0.65/cd.
7) Total Operation Costs (see Fig. I), Estimated Values[1]	1.50	1.50	1.50
8) Total estimated cost per cord	2.56	2.31	2.15

difficult, if not almost impossible, to obtain data in the three following categories which was not subject to variation: (1) Annual production rates, (2) Useful life of equipment, and (3) Annual average cost of repair and upkeep.

It is readily apparent that the substituting of various values in these three categories will result in a wide variation of final values reflecting cost per unit produced. Thus, any company planning to put equipment of this kind into operation will do well to compute its own cost estimates.

CONCLUSIVE THOUGHTS—Using these cost estimates as a basis of study, the following conclusive thoughts become apparent:

(1) Supplemental supplies of wood fiber coming from mill wood wastes can be had with little sacrifice in available manpower. In fact the mechanical equipment employed in this converting process definitely acts as an efficient "multiplier of men." Production rates per man day oftentimes far exceed our best present-day accomplishments in producing wood fiber in the pulpwood form.

(2) As applied to slab and log debarking operations, the fixed costs account for about one-half of total cost per unit produced. This indicates the desirability of always trying to increase production per year (running more hours per year, increasing efficiency, or both) and fostering the development of better and less expensive equipment.

(3) Recent development in way of a practical yet inexpensive log debarker lends encouragement to those who want to manufacture chips at a sawmill with an annual production as low as 2½ million bd. ft.

(4) Conditions permitting, a sawmill operation equipped to debark logs and manufacture pulp chips seems to experience the greatest margin for risk and profit.

(5) A pulp mill equipped with suitable slab debarking equipment, if surrounded by numerous small sawmills, probably would be selected as the kind of installation experiencing the next greatest margin of risk and profit. Reasonable transportation rates can enable placement of these slab concentration points some distance away from the mill.

(6) Installation of inexpensive slab debarkers or log debarkers in small sawmills and funneling of peeled slabs into a chip concentration yard are worthy of the increasing attention this technique is receiving.

(7) Pulpwood debarkers incorporating the principles of cambium-shear bark removal and stick-by-stick feed are showing encouraging promise. Accurate and representative operating cost information, however, is not yet available. The same seems to apply to the newer slab debarkers.

Progress to date in the development of new type debarkers has done much to stimulate programs designed to "increase wood fiber yield from each tree and acre of forest land wisely harvested." By so doing, the pulpwood industry is performing an outstanding job of "growing more timber," practicing good forest management, and learning to make its work force more productive.

What about Rubber Tire Tractors?

Now a "fullfledged landslide" in the South, trend continues in North and Far West, often complementing crawlers

By R. O. GUSTAFSON
Westvaco Experimental Forest
Georgetown, S. C.

● The trend toward rubber tire tractors in logging became a full fledged landslide in the South several years ago. The Ford and the Ferguson are now and have been for some time the standard pulpwood skidding tractors in that region. Together with other farm type rubber tire tractors they account for 80 to 90% of the pulpwood tractors now in use.

Continued improvement of these light tractors, new development of specially designed rubber tire logging tractors, the extension of road systems and a continuing decrease in average tree size indicate that for pulpwood logging the rubber tire tractor will maintain or improve its position.

For logging larger timber and for the more difficult chances the crawler tractor remains the dependable skidding unit. But within the last five years there have been a number of major developments in specialized rubber tire logging tractors. A number of new machines are making serious bids to invade what has been the crawler's exclusive field. Notably on the West Coast and in smaller editions in the East these new tractor and truck skidders are attempting to replace crawlers.

RUBBER TIRE ADVANTAGES—The primary advantages they seek are the elimination of expensive track maintenance, greater speed on a swing and self mobility on short moves. The big problems they must solve are flotation and footing in rough going. From the serious consideration being given this rubber tire field by both independent and major manufacturers it seems certain we will see more and more rubber tire tractors in logging. Perhaps not to do the job by themselves, but as a suitable machine where conditions permit and as a complement of a well planned logging job on which crawlers and wheeled tractors work together.

Terrain, ground conditions, size and volume of timber and transportation facilities all influence the type of tractors used in logging. Other factors in the economy of a region or locality also exert influence. In areas where farms and forest are intermingled people have and are familiar with farm tractors. Local dealers give them good service. Naturally farm type tractors will be used in logging.

SURVEY DATA—A survey of 551 producers over the entire state of South Carolina who delivered wood to West Virginia Pulp and Paper Co. during one week in January revealed some interesting figures:

In the Coastal Plain Region—Skidding Pulpwood—8.9% used crawler tractors—D2's, TD6's, John Deeres; 44.3% used rubber tire tractors—Fords, Fergusons, Farmalls, etc.; 3.8% used other skidding devices; 43.0% used no skidder—they loaded at the stump.

In the Piedmont Region—Skidding

Pulpwood–1.6% used crawler tractors –D2's; 12.4% used rubber tire tractors–Farmalls, Fords, John Deere, etc.; 0.3% used other skidding devices; 85.7% used no skidder–they loaded at the stump.

At the same time in January a survey of sawlog and pole loggers in Georgetown County, South Carolina found the following tractors in use:

Georgetown County, Coastal South Carolina–Skidding Sawlogs–2 Caterpillar D4's; 4 International TD9's; 12 Allis-Chalmers HD5's; 2 International TD14's; 20 Crawlers.

12 Fords; 6 Fergusons; 4 Fordson Majors; 4 Case; 1 Farmall M; 27 Rubber Tire Tractors.

In these surveys among the sawlog loggers, 57.6% of the tractors were rubber tired. Among Coastal pulpwood loggers, 83.3% of the tractors were rubber tired. Among Piedmont pulpwood loggers, 88.7% of the tractors were rubber tired.

International Harvester Co. estimates there are 4,000 International and Farmall rubber tire tractors in the logging industry–and that estimate probably doesn't include tractors owned by farmer-loggers.

TRACTORS WITH RUBBER TIRES The Wagner Loggermobile. Some 25 are reported in operation in Canada and on the West Coast.

Caterpillar's experimental DW2 just sent into the field for testing.

The FWD Blue Ox. A skidding unit adapted from a truck is now in production.

CURRENT DEVELOPMENTS–No one machine is suited to every condition encountered. Where enough suitable work is available loggers generally prefer a rubber tire tractor. It isn't the all-purpose machine that the crawler is, but the desire to get on rubber where possible is spurring manufacturers into the field. Here are some recent and current developments–and this list is by no means complete or a full indication of manufacturers' interest in rubber tire tractors:

In the East developments have been aimed at both pulpwood and sawlog tractors of small to medium size to take the place of crawlers. Among machines that are in use or undergoing tests are:

FWD Blue Ox. A 4 wheel drive, front steer, gasoline powered truck skidder developed over the past four years following logger conversion in Maine to FWD trucks. A rugged machine with an integral arch built to compete with medium size crawlers. Extensively field tested and redesigned. Now reported to be fully ready for full scale production. Road speeds 6 to 44 mph. Price $7,200. Mfr. Four Wheel Drive Auto Co., Clintonville, Wis.

J. T. Go-Getter. A 4 wheel drive, front steer, gasoline powered tractor with many unique features. Hydraulic front wheel suspension gives up to 16 in. of vertical oscillation. Tires of 14 x 26 or 18 x 26 give unusual flotation and ability to work in soft ground. Works in the D-4, HD5, TD9 class. Has integral arch, torque converter, automatic transmission, power steering. Ten production machines were put into the field last summer and have been undergoing tests. Several changes have been made in the machine and a new batch of production models is reported in manufacture. Speeds 5 to 14 mph. Price $8,100. Mfr. C. I. Capps Co., Inc., Jacksonville, Fla.

Fordson Major Diesel. A regular heavy duty farm type tractor deserves mention here because of its enthusiastic acceptance by loggers. With tongs or chain chokers attached to the hydraulic lift, it has proven to be a fast skidding machine. Operators report very low fuel consumption and low operating cost. Manufactured in England and distributed by Ford Motor Co. Price along the East Coast, $2,900.

Caterpillar DW2. A first experimental model of the new D2 converted to a chain drive wheel tractor and just put into the field for experimental tests. This tractor is fast (3 to 11 mph) and shows promise of developing into a real production machine in suitable conditions. Of special interest here–it indicates the interest of this major manufacturer of tractors.

Caterpillar DW6. A conversion of the D6 crawler using 18 x 26 tires. About 40 of these conversions have been made by D6 owners, mostly for road machinery work. An experimental DW6 equipped for logging has been tested in Michigan and in Maine with reported excellent performance. Speeds 3 to 14 mph.

Two important developments have contributed to the general use of rubber tire tractors for logging in the East. The development of half-tracks for farm-type tractors has increased their traction in soft going. These rigs have gained general acceptance and can be purchased for about $500. More recently the use of inner liners for tractor tires has greatly reduced punctures in the woods and increased tire life. Such liners can be purchased for about $10 to $15 each.

WESTERN DEVELOPMENTS–On the West Coast with larger timber and mountainous country develop-

ments have been quite different from the East. Large units often designed for use on a rough haul road with long hauls are typical of western rubber tire units. These seem to be finding a place as long haul units in conjunction with crawler tractors which bunch loads at the haul road. Among units under test or in operation are:

Wagner Loggermobile. A big powerful and rugged looking machine with a 200 hp diesel engine. Twenty-four units reported sold in British Columbia, and the company reports a good backlog of orders. Machine is reported operating under all conditions of ground and terrain skidding 4000 to 5000 ft. per load. This 36,000 lb. machine uses 18 x 24 tires and operates at speeds of 0 to 24 mph, forward or reverse. Among its important features are the diesel engine with torque converter, an integral arch, front and rear blades, 2-way operator position, 4-wheel planetary drive and a unique and exclusive pow-r-flex coupling of the two powered axles. Details are reported in APA's Equipment Handbook Release No. 251. Price $32,000. Mfr. Wagner Tractor, Inc., Portland, Ore.

LeTourneau Electric Arch. This application of LeTourneau's Electric Wheel to a logging arch and prime mover is aimed at big production in big timber. Each of the 4 wheels is powered by its own electric motor, as are all other operating parts of the arch. Thirty ft. long, 12 ft. wide and with 73 in. O.D. tires, this machine would seem best suited for rough haul roads. Independent front and rear axle steering permit sharp turns. Speed 11 mph. Reported to handle 6,000 bd. ft. loads. Price $40,000. Mfr. R. G. LeTourneau, Inc., Longview, Tex.

Caterpillar DW20. A four wheel drive test tractor with integral arch. Has undergone extensive tests in the West. Powered by a Caterpillar D337 engine. Front tires 16 x 25, rear 24 x 29. Speed 2 to 25 mph. George J. Carr of Pacific Car and Foundry Co., in his report as Chairman of the Logging Division, Forest Products Research Society, states the engineers who conducted the tests feel there is a definite place for rubber tire tractors in logging, perhaps as a complement to crawlers.

Caterpillar DW15. This smaller test tractor is equipped with an integral hydraulic skidding pan. Front tires 12 x 20, rear 21 x 25. Speeds 2 to 24 mph.

Westfall Performer. A front steer truck type skidder with integral arch, large tires and good speed. Mr. Carr in his FPRS paper reported about 18 units in operation last year. New specification sheets on this machine reported to be in process by the manufacturer, P. J. Westfall Co., Portland, Ore.

LeTourneau-Westinghouse. Reported by Mr. Carr to have the best western sales record with a 4 wheel drive unit.

These and other companies are certainly testing the possibilities of rubber tire tractors both in the East and on the West Coast. High speed on long hauls, ability to work at other jobs such as pulling road machinery, ability to move from job to job on their own wheels and elimination of expensive tracks are strong points in favor of rubber tire units. With interest aroused in this field and with engineering skill massed behind it we can certainly expect to see more rubber tire tractors.

What's New in Power Saw Use

Review of recent mechanical changes and development, and how chain saws contribute to pulpwood production

By F. E. PEARSON JR.
Eastern Pulp Wood Co.
Calais, Maine

● It seems best to deal with this subject in two parts or from two different lines of approach. First, to review the more recent mechanical changes that have been made and the results that have been reported or that we know about. Second, to consider the use or application of chain saws as they have contributed to or affected pulpwood production in our particular area.

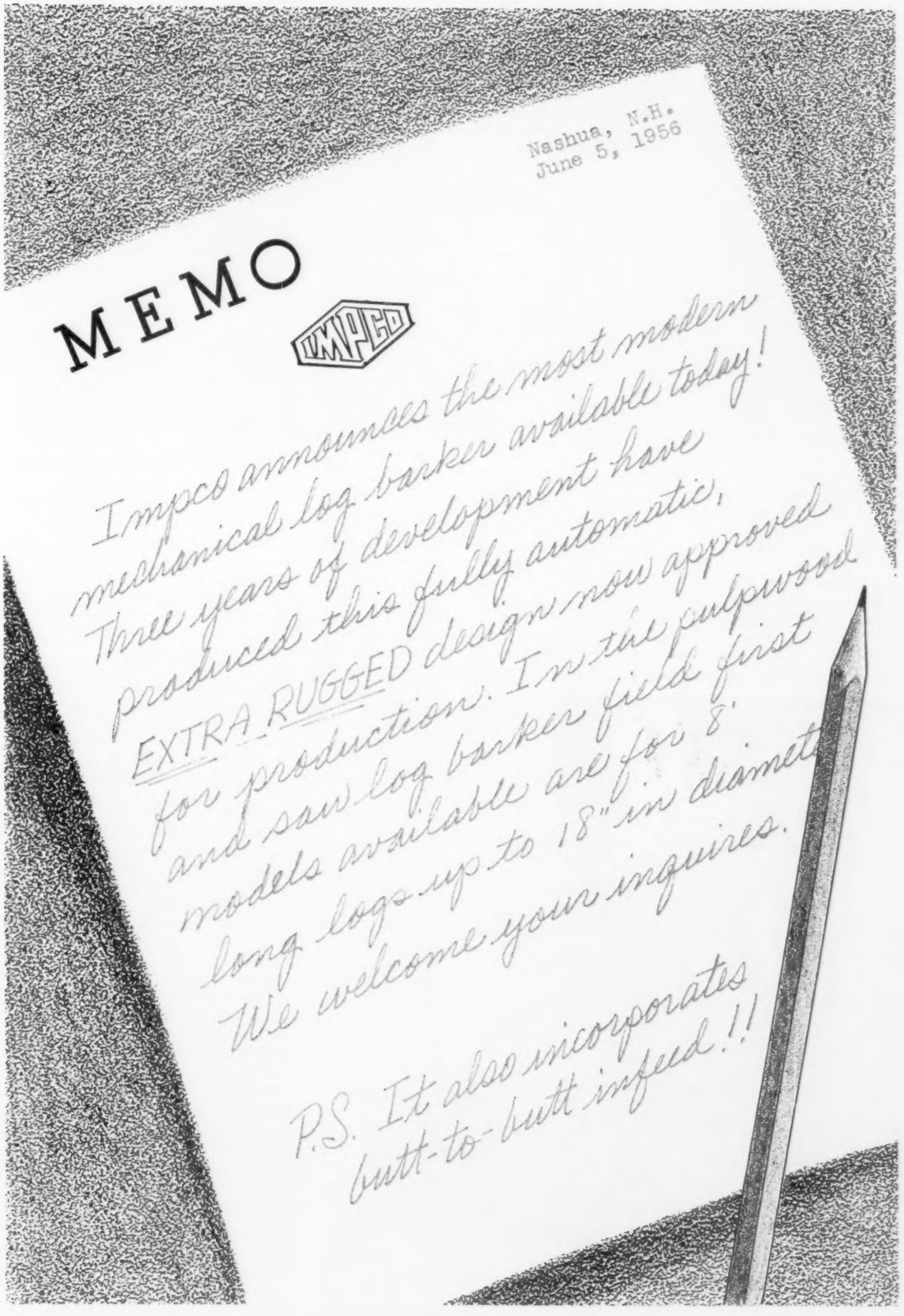
A discussion of mechanical aspects of progress in chain saw manufacture needs some qualifying, and to justify this I quote from Chain Saw Age magazine of October, 1955, "Advancements in high speed saws are being made so fast that before the ink dries on this paper this article will probably be obsolete."

However, I think we can hit the high spots and comment briefly on some chain saw developments.

(1) **THE RECENTLY DEVELOPED SILENCER,** being manufactured by several companies. Our experience has been that the loss of power more than offsets any gain that is received by reducing the noise. Recent reporting in some technical papers put together in the South seemed to confirm our experience, so I don't think we will do very much more with the silencer until there is evidence that we are not going to lose too much power when using it. Of course, it is a rather inexpensive item and anyone can try it that wants to see how it works.

(2) **THE GEAR DRIVEN SAW.** We have had no experience with gear driven saws and I have had to put my information together from what I can read in magazines and technical bulletins. In the first place, it appears that the high speed chain saws are somewhat ahead in development to the gear driven saw, as far as production is concerned, which of course is all due to the speed of the chain. There seems to be a better utilization of power with the high speed saw, although claims are made for better efficiency in large timber with the gear driven saw.

(3) **THE RECIPROCATING SAW.** We own several reciprocating saws and have found them to be quite efficient under certain conditions. With relatively small timber they do an excellent job and they seem to be well adapted for use with the one man jobber who is operating in this kind of wood. New blades and guides have recently been offered by the manufacturer which improve efficiency. We are all familiar with some of the advantages of this type of saw; namely, the low cost of the blades and the easy sharpening and changing that is offered. I think as time goes on this saw will find more use, but there definitely seems to be some disadvantages in use with large timber.


Nashua, N.H.
June 5, 1956
MEMO
IMPCO
Impco announces the most modern mechanical log barker available today! Three years of development have produced this fully automatic, EXTRA RUGGED design now approved for production. In the pulpwood and saw log barker field first models available are for 8' long logs up to 18" in diameter. We welcome your inquires.
P.S. It also incorporates butt-to-butt infeed!!

(4) **SNAP-ON ROLLER BEARING.** One logging engineer writes about a new improvement as follows: "Another development is the new snap-on roller bearing nose guide being offered by Mall Tool Co. The snap-on roller bearing reduces friction between the fast cutting chain and the guide bar. They claim that by freewheeling the chain, the saw will develop up to 20% more usable cutting horsepower. Any bar shop or machine shop can machine any make of guide bar to accept the roller bearing. A template for machining the bar is supplied with each snap-on roller bearing unit. The bearing is simply pressed into the slots that are machined in the nose of the guide bar and it literally snaps on and can be removed by a light tap of a hammer. The bearings are presently available in 2½ and 3½ in. diameter sizes for use on any bars up to 54 in. I am not at all familiar with this development but further information is available through the Association, and I imagine we will all want to try this new gadget and see for ourselves what the merits are, if any.

PROGRESS WITH CHAIN SAWS. As to the progress that has been made in the use and application of chain saws on pulpwood operations, we can, I think, make some interesting comments from our own company's experience. For background I can say that our first chain saws were company owned, due to the fact that we operate in a settled community and we didn't feel that we could force the men to buy the saws. We equipped our entire operations with company saws and progress starts there.

Gradually our two-man crews began to buy a single saw and use it between the two men. There was some increase in production and we found that our labor situation had eased considerably as a result of these chain saws, either company or privately owned.

Gradually each man has equipped himself with a chain saw so that our crews now are set up with a privately owned chain saw with each man across the board. Quite frequently we are finding now that our two-man crews are equipping themselves with three saws, one to serve as a spare in case of a breakdown. I anticipate that within a year this will be the general practice in this part of the country.

This development toward privately owned chain saws perhaps explains the reason that the Internal Revenue department has declared the chain saw to be a tool of the trade and not an item of equipment that can be rented by the employer. This ruling has been released within the year and I suspect that it means the end of hand sawing as far as the pulpwood industry in the Northeast is concerned.

RECENTLY DEVELOPED SILENCERS, such as one seen above, reduced the noise of the chain saw—a gain partially offset by loss of power in the saw.

SOME INTERESTING STATISTICS. Now our company employs a relatively small crew to cut our wood in the state of Maine. Our top level of employment was 70 men during 1955 and of course during certain unfavorable weather conditions we reached the point of not doing any cutting. The average number of men throughout the year was 40 and from this list I have tabulated the production records of 19 individuals. In this list of 19 there are 13 bonded Canadian aliens and 3 Canadians who entered the country under visas. The other 3 are natives of Maine.

These 19 men using chain saws (and these figures are all related to chain saw production) earned an average of $3,800 during 1955 on the cutting job alone, or, in other words, doing no work for Eastern Pulp Wood Co. other than cutting pulpwood at piece work rates.

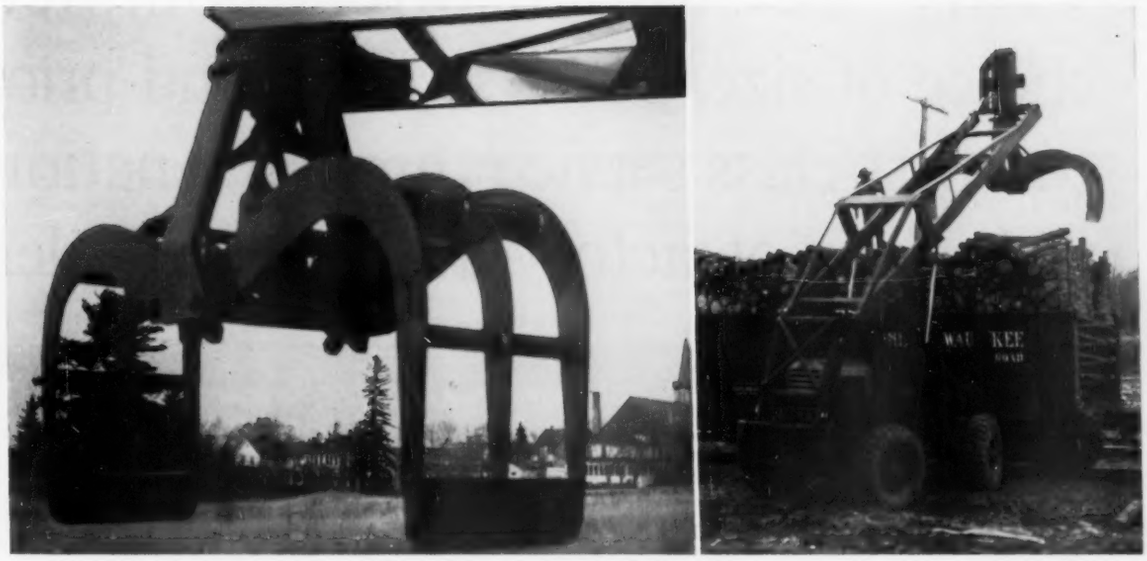
They produced an average of 613 cords at an average hourly rate of $2.07, including overtime. The best producer earned $5,105 for the calendar year and the lowest, $3,014.

The best producer produced 903 cords during the year at the rate of 3.87 cords per day. The highest rate of production was 4.01 cords per day, for a total of 891 cords during the calendar year. The average production per day was 3.30 cords.

The 13 Canadians represent 32½% of the number of Canadians in the country at any one time and lack of work, as far as the company is concerned, accounts for the percentage not being above this figure.

Our company is plagued with the problem of bark removal on mixed stands of spruce and hemlock, in order to make it possible to river drive the hemlock without undue losses on account of sinkage. I think with better plans we can even out, or level out, the cutting program to the end that it will not be necessary to lay off cord cutters other than during periods of extremely unfavorable weather. If we can do this, we can add to the list of men making over $3,000 per year and I think maintain our production rate of over 3 cords per man per day.

To my mind this represents what's new in the use of chain saws and at the same time I feel that it opens tremendous possibilities towards solving some of the problems that we have been having with our seasonal labor requirements. Perhaps after all there is something good to be said about the employment that we have to offer.



TYPICAL OF POSITIVE CONTROL GRAPPLES now being made available for pulpwood handling are these. At left, rotating attachment which permits 270° rotation of grapple; it consists of a ring bolted solid to grapple head and a frame supported on the ring by roller wheels. At right, grapple control of lift and carry type, primarily designed for use where pulpwood has to be removed 30 ft. or more. Grapple is mounted on a power controlled swivel, and rotates through 360°.

More with Positive Control Grapples

Now "one of most versatile and flexible tools of industry," improved equipment will handle twice as much wood

By E. F. O'HARA
Armstrong Forest Co.
Johnsonburg, Pa.

• Within the last year considerable interest has been shown in the possible uses of positive control grapples for handling pulpwood. I personally feel the term positive control should be restricted to the equipment which actually has positive control of the grapple, and some other terminology should be used to describe grapples which are attached to slings and subject to uncontrolled swaying and turning, or attached to equipment in such a way that there are many limits to the way in which the grapple can be controlled, but I have tried to include here all types of equipment which have been described as having positive control grapples.

It appears the idea of a really controlled grapple has been in the minds of a good many persons for a long time and some companies have devoted much time and money to development of a really controlled grapple.

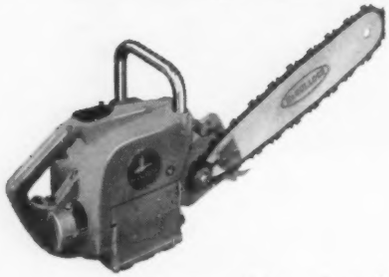
Some of the development of a controlled pulpwood grapple results from adaptation of hydraulic control grapples used for log handling. The log types adapted to pulpwood use can be illustrated as similar to presently advertised Berger-Rees air tongs which are attached to the dipper stick of a power shovel or the tag line control for grapples used with cranes.

As with all equipment which has been introduced in the pulpwood industry in the last decade the present equipment with positive control grapples will probably be greatly improved as experience is gained in its use. Unfortunately, there has not been any large scale operation using controlled grapples so that comparisons with other methods of handling are practically nonexistent. However, it does seem significant when one manufacturer with no previous experience in this field and no operators experienced in the use of the equipment can move into an operation and handle twice the amount of wood which was previously handled by other methods and other equipment. This would seem to indicate that it is very worth while to take a good look at all the equipment which offers grapple control.

HOW IT WORKS—For the purpose of discussion let us look at one of the controls for grapples used with cranes. The rotating attachment is installed on the grapple head and consists of a ring which is bolted solid to the grapple head and a frame which is supported on the ring by roller wheels. The frame is held in position by tag line cables controlled by the operator of the crane. It permits a 270° rotation of the grapple and the operator can use the tension, which is power applied, to rotate the grapple right or left or increase the tension of both lines simultaneously to cast or back cast the grapple and likewise the grapple can be prepositioned during the swing cycle.

With this type of equipment it has been demonstrated that the elapsed time for moving 5 cords was reduced from 25 min. without the control to 19 min. with the control, and man-minutes per cord were reduced from 25 man-min. without the control to 7.6 man-min. with the control.

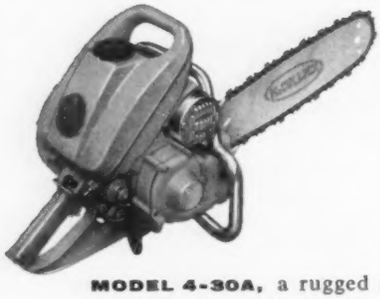
Only McCulloch offers complete choice of size, power, weight, and price, *plus* first-class service through a nation-wide chain of factory-authorized dealers



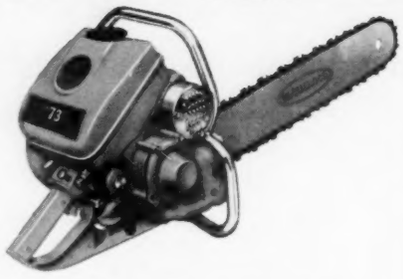
MODEL 33B, lightest in weight (20 lb complete), lowest in price. Blades available up to 26 inches.

SUPER 33, fastest cutting of all saws in its weight and price class. Packed with power and speed. Blades up to 26 inches.

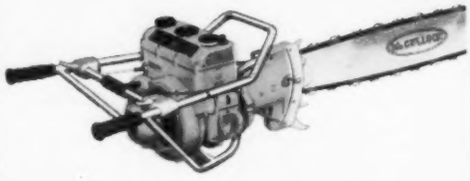
MODEL 47, a dependable and durable saw for pulp or medium-sized timber. Blades up to 42 inches long.



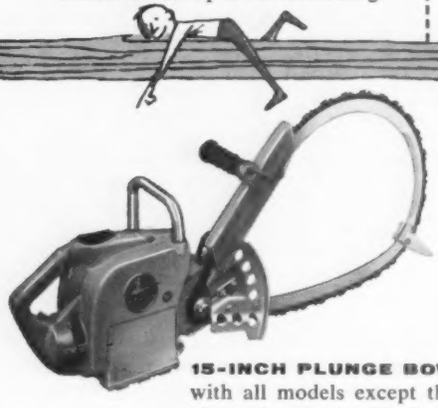
MODEL 4-30A, a rugged saw for production cutting in any size timber. Blades up to 42 inches long.



MODEL 73, fastest cutting of all one-man saws. For high production in any size of timber. Blades up to 42 inches.



MODEL 99, largest, most powerful saw in the McCulloch line. Blades up to 60 inches, plus 20-inch bow.



15-INCH PLUNGE BOWS are available with all models except the 99. McCulloch plunge bows cut with the tip, save time and labor felling and bucking pulp and cordwood.

McCULLOCH

World's largest chain saw builder

McCulloch Motors Corporation,
Los Angeles 45, California

5-5005-B

In all demonstrations of this equipment it is quite evident much of the success of its use depends on the skill of the operator, and it further appears that such control is actually awkward for the operator who has been trained in the use of a full swing grapple. It would appear that once the operators become really experienced in the use of these controls that they should get much greater production than non-controlled grapples and have much less need for helpers.

DESIGN ON DRAWING BOARD—At this time there is no specific type of grapple manufactured for pulpwood handling which can illustrate the grapples that are available for power shovels with a dipper stick, or operate on similar principles. However, one manufacturer as a result of research in this field has on the drawing board equipment which they expect to introduce. They are currently closely watching developments in this field and are seeking information from the industry to put the finishing touches on the equipment before introducing it.

The design at present is for a ¾ cord grapple to be rotated hydraulically. It can be tipped fore and aft in line with the boom axis and the boom will rotate with the cab a full 360°. It is being considered as an attachment on a 10 ton truck crane for use in handling 4-ft. wood, and on a 15 ton truck crane for use in handling 8-ft. wood. Boom feet and cable leads will be interchangeable on many of the manufacturer's present crane and shovel models to facilitate field testing of the equipment.

The next type of equipment which is using a control grapple has had considerable trial in the field and is mounted on a type base which has been quite widely accepted in both the log handling and pulpwood handling field. This equipment as advertised by its manufacturer is of the lift and carry type and is primarily designed for use where the pulpwood has to be removed some 30 ft. or more. This equipment is available in 2 or 4 wheel steer and 4 wheel drive and is designed to handle 6000 lbs. when equipped with the grapple.

The grapple is mounted on a swivel which is power controlled and rotates through 360°, although the boom is fixed to the carrier and not mounted on a turntable. Hydraulic down pressure on the boom can be used to force the grapple into the load.

With its big flotation tires it is adapted to handling on all kinds of terrain and the 4 wheel synchronized steer makes it highly maneuverable. The wheels are attached so as to provide a choice of front wheel steer, synchronized 4 wheel steer and oblique steer. Tires are 14:00 x 20, turning radius with 4 wheel steer is 14 ft. 3 in. and it has traveling speeds from a work range of 1.4 mph to 10.8 mph to a road range from 3.6 to 27.7 mph. Reversing gear box utilizes transmission gear range for both forward and reverse. Power steering and power brakes are standard equipment.

NEWEST TYPE EQUIPMENT—Probably the latest equipment to be introduced in this field is one which would appear to me to be one of the best illustrations of a positive control grapple. This type on its present base is primarily adapted for pulpwood handling where it is not necessary to carry the load for any great distance.

The present base is a self-propelled carrier somewhat similar to the base used on the carrier type, although it is not as maneuverable nor as fast. It would appear that a grapple and boom of this type mounted on the carrier type base might well become one of the most flexible and versatile handling tools for the industry.

Total weight of the unit and self-propelled carrier is 30,000 lbs. and the equipment is controlled entirely by hydraulics. Maximum lift of the boom, to the bottom of the load, is approximately 18 ft. and the capacity at its maximum extension is around 3000 lbs.

Since all controls are hydraulic and the steering is remote, all controls can be said to be powered. The cab can be adapted for all weather use. Turntable swing is throughout 360°. The telescopic boom extends and retracts through 12 ft. and is mounted in a ring support so that it can be rotated through 90°.

The grapple has a wrist action which permits a 90° adiustment so that it can reach straight down or straight out or in any intermediate position. The grapple can also be rotated at the end of the boom through 200°. The operator has down pressure on the boom to force the tines or grapple into the load.

The basic equipment, although new to the pulpwood field, has been proven over many years use in the construction field. The addition of a fully controlled grapple has brought the manufacturer into the pulpwood handling field. There have been only a few grapples available up to this time. However, this manufacturer is presently preparing to provide field demonstration units for the industry.

DOUBLED PRODUCTION—It is this equipment with inexperienced help which doubled production over other methods of handling on one particular operation. The controls on this equipment may be said to be precision controls and are extremely smooth in operation. Literally, movements can be controlled to the fraction of an inch.

The results that seem significant and were witnessed on some operations were less operator fatigue and fast but careful handling. Further observation would seem to indicate that much less training is required for an operator to be proficient in the operation of the equipment than would be required on crane type equipment. One remark heard at a demonstration of the equipment was that the machine is almost human.

The types of equipment discussed are most generally suited to yard use and it is interesting to note that the recent American Pulpwood Association Release No. 218 describes a smaller, but similar type of equipment mounted on a pulpwood truck so that truck driver can load and unload his own truck. The truck is equipped with hydraulically controlled boom and hydraulic grapple which is supported by a cable from the boom. The boom is approximately 15 ft. in length and the capacity is approximately 1500 lbs.

I have tried to avoid any inference that any of the equipment mentioned is as good, better than, or worse than any other types of equipment being uesd and, although I am personally enthusiastic about this method of handling, this is not a case for the method as compared with other methods of handling. I do feel this method of handling deserves close attention at this phase of its development because it seems to offer a solution to some problems experienced.

ADVANTAGES NOTED—Some of these problems affect the personnel who handle pulpwood and this type of equipment seems to offer possibilities for employing less skilled and older operators and should result in less total man power required. It also appears that with positive control of the equipment there is less hazard to the men employed in the yard.

If this method of handling can be proven as economic as the stacker, crane and sling and other methods being used in many yards, it would result in better utilization of yard space and a better rotation of the wood in storage, which should also result in less deterioration. Observation of some operations indicated that many of the methods for handling pulpwood result in considerable damage to trucks, and particularly railroad equipment. It seems quite probable damage can be reduced by better control of handling equipment.

Training and Safety

(L to r) LESTER POLLARD, Minnesota & Ontario Paper Co.; JOE H. BRADY, Joe H. Brady & Associates.

Tips on Care and Use of Power Saws

What dealers and distributors can—and should—do to aid customers in proper handling and upkeep of saws

By JOE H. BRADY
Joe H. Brady & Associates
Birmingham, Ala.

● Power saw training includes many things beyond the training of a man to hold the gas lever down when a saw is in the log.

First, I'm going to tell you briefly something of the growth of the chain saw business and the pricing of chain saws, because it has a very definite bearing on the subject I'm discussing.

I've been selling chain saws since 1938. The first models were operated from a gas engine by a flexible shaft. Later the saw was attached to the engine. When this early model was first offered on a production basis it weighed over 120 lbs. It was supposed to have 5 hp and it sold for $685, not including cost of an electric chain grinder usually needed for the chain then used. And, significantly, the sale price contained only a sales commission—not a dealer discount.

It is an accepted opinion that the way to advance prosperity and achieve higher standards of living is through science and technology—taking advantage of better tools, methods and organization, and substituting machines and mechanical power for human muscle. This is basically the program of this Association.

To produce more with the same amount of human effort through technological improvement is a sound economic and social objective. It discards the false philosophy of made work, feather-bedding and the erroneous idea that machines take the bread out of workmen's mouths.

These thoughts, however, were not too easily sold in the early 1940s to men whose fathers had produced more than enough lumber and pulpwood with crosscuts.

Progress was slow but sure, however, and as sales continued to increase, prices were reduced. Today many manufacturers offer saws that weigh less than 30 pounds, and at less than a third the 1941 cost. Moreover, these models can operate efficiently all day without difficulty and they produce from 2 to 5 times more pulpwood for their users.

CHANGE IN MARKETING – In 1948, a change was made in the marketing of chain saws. I like it. Happily for me I was a participant in one such change. Distributors were appointed to warehouse saws and parts, train mechanics and users and to set up dealers.

I believe it is by far the best way to sell chain saws. I believe, too, it is the very best way to help expand your business. On this point, in October 1953, Malcolm McNair, of Harvard Business School, made this statement: "Instead of thinking about distribution as being secondary and subsidiary to production, we ought to recognize that it is often distribution which comes first and creates opportunity for production."

When the dealer sells a chain saw he is obligated to give the buyer the best possible service and training. We are all on the same team—the customer, the dealer, the distributor and the manufacturer. If it is a good team, then the interest of one should be the interest of all.

DEALER RESPONSIBILITIES– Under the present method of dealer selling–whether through a distributor or branch store–the customer should expect several definite dealer responsibilities.

(1) Having read, or heard, of chain saws, the customer decides to buy one. Logically he starts looking for a dealer who sells the saw the buyer is most interested in. A buyer seldom looks up a distributor and even more seldom does he go to the manufacturer. Therefore a dealer should be readily known through advertising and proper identification on his place of business.

(2) Having been told what use is to be made of the saw, the dealer

should be able to recommend a particular model for the customer's need. (It is because of this widely varying need for many different models and sizes that some manufacturers make a complete line of both models and sizes.) Confidence in the dealer will mean ready acceptance of his recommendation as to size and model.

(3) Following the sale the dealer should carefully and patiently explain and demonstrate all features of the saw. This explanation should be most explicit and, if necessary, should be repeated until thoroughly understood.

(4) The dealer should stay with a customer until he is sure he thoroughly understands the saw and how to use it. A dealer should never assume that the customer is completely satisfied and knows all about his saw despite any display of "know-how."

(5) If it happens to be the second or third purchase, the sale should present an excellent opportunity to point out mistakes made in former operation so that better performance may be had from the new one. If it is a different model from a former purchase, the dealer should explain in much detail the different features.

(6) If the customer is buying a different make saw from one used before, then he should be carefully instructed on the features, especially new or different developments.

One of the great problems existing in the chain saw business today hinges around the man who has been running saws for some time and thinks he knows all about them, and who resists the help and instruction of a dealer. I don't deny that experience may be a fine teacher, but it can be observed, also, that the longer a man is wrong, the surer he is he's right.

TROUBLES TO CORRECT—Regardless of how much instruction or training is given, there are several trouble factors that seem difficult to correct. These are: (a) Using the wrong kind, or improper mixture of oil; (b) Not keeping air filter clean, tight or in place (and, sometimes, not even on the saw); (c) Constantly running saw in rocks or sandy soil; (d) Not keeping oil (from automatic oiler) on chain; (e) Not keeping sufficient oil in gearcase; (f) Not keeping carbon removed from muffler; (g) Not giving ordinary, everyday, preventive maintenance and, (h) The most, and worst of all—not keeping chain filed properly.

A dealer should be reminded constantly to show the customer the proper way to file a chain. (Although the best method of keeping a properly filed chain is to bring it to the dealer regularly for sharpening and correction.) Owning a spare chain, or chains, by a saw user is a sure way to increase chain-wear life.

Furthermore, the dealer is obligated to the purchaser to have available a trained mechanic whenever maintenance or repair service is needed. Obviously he should have complete shop equipment. Definitely he should have an adequate stock of service parts.

SOURCES OF INFORMATION—Although most chain saw dealers are not expert woodsmen, they should know the proper usage of chain saws. Dealers should impart this knowledge of "right ways" and "wrong ways" to customers. There are many resources at his command to do this.

One excellent book titled, "How to Use a Power Chain Saw," prepared with the help of a fine writer and practical logger, is distributed by one saw manufacturer. A fine circular, "Power Saw on the Farm," is distributed by the Ala. Polytechnic Institute. APA has an excellent manual titled, "Power Saw Operator's Notebook." I highly recommend it for your producers. We have been privileged to distribute a quantity of these books and are expecting to distribute even more.

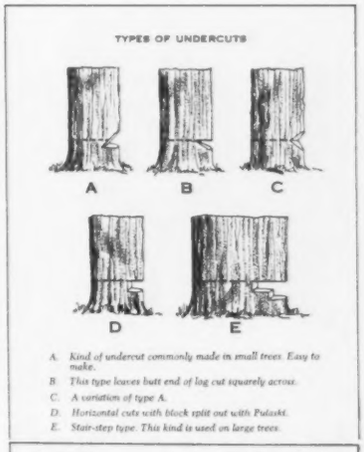
THE DISTRIBUTOR HELPS—The distributor, too, with his own organization of sales and service representatives in other ways, is effective in power saw training. These men, when making their regular calls on dealers, show the latest improvements, changes and modifications in saws. They instruct the dealer's mechanic on new techniques of improved service and maintenance.

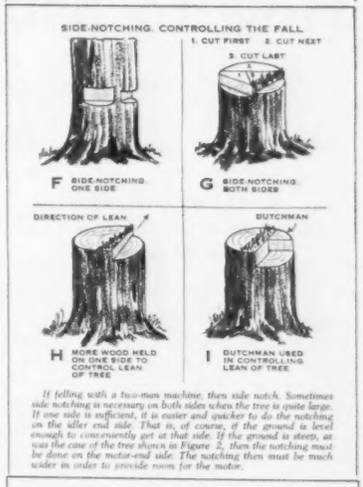
These men have experience in the woods. They make calls on saw users to instruct the saw operator on good sawing practices, on methods for the best use and care of his saw and, of course, to instruct and recommend the over-all practice of safety.

The distributor also conducts field demonstrations with county agents, foresters and the field representatives of paper and lumber companies. He tries to acquaint more people with the use of chain saws as a method of educating the public in better forestry practices by cutting low stumps for increased yield, improved land conditions and in other ways.

The distributor is usually alert to unfair legislation to the industry and takes his stand, along with men from the forest industries, in the legislature and committees on such matters. He, likewise, uses his efforts and influence whenever possible to get greater appropriations for fire prevention, insect control and conservation programs. Increasing the interest of landowners to become Tree Farmers is, also, one of his interests.

With the vastly increased number


TYPES OF UNDERCUTS
A
B
C
D
E
A. Kind of undercut commonly made in small trees. Easy to make.
B. This type leaves butt end of log cut squarely across.
C. A variation of type A.
D. Horizontal cuts with block split out with Pulaski.
E. Stair-step type. This kind is used on large trees.


SIDE-NOTCHING. CONTROLLING THE FALL
1. CUT FIRST
2. CUT NEXT
3. CUT LAST
F SIDE-NOTCHING. ONE SIDE
G SIDE-NOTCHING. BOTH SIDES
DIRECTION OF LEAN
DUTCHMAN
H MORE WOOD HELD ON ONE SIDE TO CONTROL LEAN OF TREE
I DUTCHMAN USED IN CONTROLLING LEAN OF TREE
If felling with a two-man machine, then side notch. Sometimes side notching is necessary on both sides when the tree is quite large. If one side is sufficient, it is easier and quicker to do the notching on the taller end side. That is, of course, if the ground is level enough to conveniently get at that side. If the ground is steep, as was the case of the tree shown in Figure 2, then the notching must be done on the motor-end side. The notching then must be much wider in order to provide room for the motor.

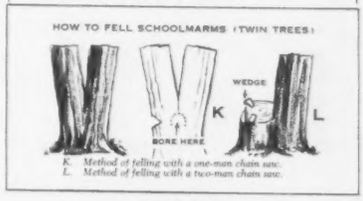

HOW TO FELL SCHOOLMARMS (TWIN TREES)
WEDGE
K
L
BORE HERE
K. Method of felling with a one-man chain saw.
L. Method of felling with a two-man chain saw.

DIAGRAM 3

"SCHOOLMARMS"

If two trees have grown together like Siamese twins (schoolmarms, they are called) and lean in opposite directions (Diagram 3), they may have to be felled separately. With a one-man machine you can make the undercut as usual and then bore in between them in order to get started on the back. When one tree is felled and out of the way, no difficulty will be experienced with the remaining one.

With a two-man chain saw the first tree is often felled over the bar. Make a regular undercut, cutting the lower kerf first. In making the upper kerf, proceed right on until in far enough to insert a wedge on each side just back of the bar. These wedges will hold the tree off the bar and chain while you cut on through. When the tree falls over the bar, no damage will be done. (See diagram 3, drawing L.) This procedure is to be followed only when the trees are grown against each other so that one will pull away from the other when it is cut through. Otherwise they have to be felled as one tree. It would perhaps be best then to put on a larger bar and chain if necessary and fell them together at a right angle to the direction shown in the diagram.

TYPICAL OF DEALER AIDS supplied to chain saw users by dealers and distributors are these pages from booklet entitled "How to Use a Power Chain Saw," which is provided by a saw manufacturer. Successful, tested methods of using chain saws are clearly illustrated.

With the vastly increased number

of dealers, it is not too difficult now for a saw user to secure good training and service within a reasonable distance from his home. This was not true only a few years past, but with prospects of continued good business to support a dealer's investment in chain saws, and parts, there will be an even greater increase in the number of service dealers all over.

What I've tried to picture in this talk is what any good, conscientious distributor is trying to do. Many distributors have made considerable progress toward accomplishing the factors I've mentioned. I'm sure, however, that all distributors, and dealers, want and desire to do all this, and more.

There are, also, two other ingredients which deter the more rapid progress in this training program. All of our troubles, if we but seek their origin, generally proceed from not knowing the use of time. Time can't be stored, like pulpwood on a yard. Neither can it be recovered. The other ingredient, and possibly in the final analysis, the most difficult to handle can be explained by one word. It explains why all the economic controls or training methods won't always work so well—the word is "people."

How to Sell Safety to Contractors

How Minnesota & Ontario found the way to reach the employe of independent contractor—the man who gets hurt

By LESTER POLLARD
Minnesota & Ontario Paper Co.
International Falls, Minn.

● In making a report on Mando's approach to safety for the independent producer, it is necessary that I briefly review the history of developments leading up to the present.

Mando's logging operations in Minnesota since the 1937-38 season have been conducted by independent logging contractors. The annual production program averages 60,000 cords of pulpwood from 25 contractors who employ a maximum of 500 men during the peak winter operating period. Being independent, these contractors are responsible for all phases of their operations.

During the first few seasons of independent contractor operations, the emphasis on safety depended entirely on the attitude of the contractor toward the subject. About the only outside approach to the contractor on safety matters during this period came from the insurance carrier's field engineer when making his annual call on the policyholder for inspection of equipment etc.

ORGANIZED PROGRAM NEEDED—The lack of any organized safety program by these independent contractors eventually began to be reflected in increased rates for workmen's compensation insurance, which continued to accelerate to such an extent during the war years and those immediately following that it was imperative an organized safety program be instituted to effectively influence the accident frequency.

Most of the independent loggers in northeastern Minnesota, including those logging for Mando, are members of the Timber Producers Association of Duluth, Minnesota. This organization was alert to the trend of increased insurance costs and quickly recognized the need for a safety program in the industry. The officers of the association authorized the executive secretary, John Hoene, to organize an effective safety program among association members.

Meetings were held by the association's safety committee with representatives of the insurance carrier, which resulted in expanded field service being provided to their policyholders. Also the association and the insurance company jointly sponsored several safety meetings each season. These meetings held throughout the operating area would bring in loggers from a radius of 35 to 50 miles of the town in which these meetings were held. The maximum attendance was usually less than 50.

Much was accomplished at these meetings in getting the importance of safety across to the producers and also from an educational standpoint they brought out very clearly to the logger that workmen's compensation insurance is a cost-plus arrangement and that only by reducing the frequency of accidents could they expect to halt the rising insurance costs.

The association is still continuing this program and also has for the past two years sponsored a safety contest for its members, with prizes being given at their annual meeting to those with the best records. The insurance carrier also contributes a plaque to the winners in this contest.

Several safety field days have been promoted by the association and at the first one, in 1953, Harry Jefferson of APA was the principal speaker and conducted the safety demonstration. Also articles on safety are printed in the association's monthly bulletin.

SAFETY CODE SET UP—Mando has representation in the Timber Producers Association and has supported their safety program wholeheartedly. D. L. Eisenach, Mando director of safety, was instrumental in having the association adopt a Safety Code patterned after that used by Mando in its Canadian logging operations. Among other things, this Safety Code suggests:

(1) Employment procedures to secure men of proven productivity and physical condition who have the ability to work without injury to themselves or their fellow workmen.

(2) Camp safety meetings.

(3) 100% member participation in association sponsored Safety contests.

(4) First aid training courses for all workers, and that the wearing of hard hats and suitable safety footwear be a condition of employment.

BUT RATES STILL RISE—All of these programs have influenced the attitude of the independent producers regarding safety. But despite these good efforts, workmen's compensation rates have continued to rise from $5.35 in 1948 to $9.45 effective August 1, 1955. Some of this increase, of course, is the result of legislative action increasing injury benefits.

However the frequency and severity of accidents have continued at about the same pace. The cost of workmen's compensation insurance has become a

FIRST AID COURSES are one way of emphasizing safety at the employe level. Scenes above are from Standard American Red Cross first aid courses offered by Mando to contractors and their foremen.

larger factor of cost each year when negotiating logging contracts. Many of the contractors had debit charges of 20% with a few as high as 30% over the manual rate for compensation insurance in the Minnesota Logging Classification Code #2702.

In our discussions with the contractors, it was very evident that they were sold on the importance of safety and recognized the increased cost to them as a result of the high accident frequency, but it was also apparent that the programs and efforts along safety lines were not reaching the contractor's employes effectively.

It was at this stage that many of the contractors invited Mando's suggestions and cooperation regarding their safety program. Mando welcomed the invitations to cooperate with the contractors on a safety program that would effectively reach the contractor's employes without disturbing the independent contractor relationship.

MANDO INVITED IN—Upon request by the individual contractors Mando's Safety and Logging Departments make arrangements to hold an evening safety meeting at the contractor's camp. The contractor arranges for attendance by his employes.

A typical program at one of these meetings includes the showing of at least one and possibly two safetv films pertaining to logging such as "Pierre and Marie" and "It's not the Axe, It's Joe." The contractor makes a short talk to his employes on safety matters inviting their cooperation and suggestions on ways to prevent accidents from happening or on any other matter pertaining to safety.

Mando representatives from the Safety and Logging Departments each give short talks stressing particularly the responsibility of the contractor to his employes in providing tools and equipment in safe working condition. They also stress the use of safety appliances, protective head gear, safety footwear and protective clothing wherever possible. The contractor's employes also are reminded of their responsibility first to themselves and their families and secondly to their employer to work safely and to make proper use of the safety appliances and protective clothing which their employer provides and to comply with all camp safety rules.

If time permits a short film on hunting fishing or some subject other than safety is shown. Following the meeting, coffee and doughnuts are usually served and a general discussion on safety often develops during this period.

These camp meetings have brought the story of safety down directly to the level of the men actually doing the work and the ones most likely to be injured. We were often surprised at the comments from the men on safety which come out at these meetings. Many men who have had serious accidents in the past start talking about them and usually blame some careless action on their part for the cause of the accident. A feeling of good fellowship develops between all of those in attendance and we are positive as a result of these meetings the attitude of the contractor's employes toward safety is much improved.

MUST BE AT EMPLOYE LEVEL—Too much emphasis cannot be placed on the importance of getting the safety program down to the level of the employes. While it is true that a good safetv program must start and be directed from the top, the results obtained will depend in most cases on how effectively the employes are reached and brought into the program.

In order to encourage the use of protective head gear and other clothing, Mando has ordered for the contractors, through its purchasing department, over 200 hard hats and several hundred pairs of lumberman's safety toe rubbers; also other safety supplies such as first aid kits, goggles, etc. This material is charged to the contractors at cost.

FIRST AID COURSES—During the past two years Mando has offered the Standard American Red Cross course of instruction in first aid to the contractors and their foremen. At the first series of meetings held in International Falls during the fall of 1954, 12 contractors completed the course and were certified. The second series of meetings were held in September and October in 1955 at Effie, Minnesota for the contractors in the southern part of our operating area and 7 completed the course and were also certified. M. F. Mattson, Mando Safety Supervisor, instructed these classes.

We plan to hold at least one additional training course each season and as a result of this training it is hoped to have at least one man trained in first aid at each of the contractor operations.

Mando also took the lead in our area by providing forest shields or canopies for their tractors working in logging and forestry operations and now have a total of 11 tractors so equipped. In order to encourage the use of these shields on contractor-owned tractor equipment, we have made the facilities of our central garage at International Falls available for construction of forest shields as requested by the contractor. To date, we have constructed 16 of these forest shields for the various contractors.

RESULTS ARE SHOWING—The results of safety efforts are not quickly evident and usually require years of intense effort to be noticeable. However, we are beginning to recognize

some positive results among Mando's contractors as a result of the combined safety efforts of the Timber Producers Association, Mando and the independent producers.

Of the total of 26 contractors producing pulpwood for delivery to Mando this season, 12 have an experience rating credit and only 9 have an experience rating debit charge. This is a very definite improvement as only a few years back practically all of the contractors had debit charges over the manual rate.

The contractors are showing a marked improvement in their attitude toward safety which is being reflected by increased interest and cooperation on the part of their employes in safety.

Briefly, this is the story of Mando's approach to safety for the independent producer. There is nothing sensational or unusual in what we have tried or what has been accomplished. Actually, we have only made a good start and it will require the utmost continued effort by all concerned to appreciably reduce the logging accident frequency.

We believe, however, that our biggest accomplishment in our approach to safety for the independent producers has been the coordination of the programs of the Timber Producers Association, insurance carrier, independent producer and Mando into a joint effort that is more effectively reaching the contractor's employes. With the continuation of such joint efforts, we are confident our safety progress will be increasingly noticeable in the future.

Industrial Forestry

(L to r) THOMAS A. SPAIN, JR., International Business Machines; ELMER SURDAM, Forest Industries Radio Communications.

Every Week a New Microwave Unit

Mobile radio systems, fast becoming "indispensable," are excellent solution to communication problems in woods

By ELMER L. SURDAM
Forest Industries Radio Communications, Eugene, Ore.

● Some may be surprised at the rapid advancement made in using mobile radio in our Tree Farm program and woods operations. We have 300 separate radio licensees in Forest Products Radio Service. These licensees hold approximately 1300 authorizations for industrial radio facilities. In addition, we have licensed a good many control and relay circuits for remoting base stations to higher elevations or for the purpose of centrally locating the transmitter and receiver.

This industry is adding new systems at the rate of one a week. One marvels at this rapid growth when it is recalled that we made our initial start in 1947 without a service or even a single channel.

The average size system is composed of 15 transmitters and receivers. More than half of the systems licensed have 2 or more base stations. We find mobile units are installed in many conveyances including vehicles, loaders, yarders, locomotives, boats, barges, planes, and I saw one on a wanigan on the Clearwater River in Idaho.

Base stations are located from sea level to an elevation of over 9,000 ft. in Wyoming and Arizona. A prerequisite for stationing facilities at higher elevations is a good road. It is surprising, however, to see remote facilities go in without access roads leading to the transmitter house. The answer to this puzzle is the availability of ski lifts and power on the top of the mountain.

INSTALLATION IN SNOW—I recall one installation that was made in Montana in the snow at about 6,000 ft. Housing facilities had been prepared on top but the license and equipment were slow in coming. In fact, the snow arrived first and winter finally settled down. It was not possible to move the units to the top over the snow. So it was decided to fly in the equipment and drop it in the snow. Men on snowshoes were on hand and dug the boxes out, installed the equipment and fired up the units. The system is still on the beam the last I heard.

These boys in Montana live in a

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big country and do things in a big way. When engineering a system, they spend no time in weighing the advantages of a mountain top installation over one that could be made in the valley at nominal costs. The only question in their minds is which mountain top will give the greatest radio coverage. The theory is to have the equipment high enough to make it possible to reach the back forty at all times. On a number of occasions this line of reasoning has paid off during emergencies in remote fields of operation.

This word "emergency" brings to mind the major purpose in making a few channels available to individuals in an industrial service such as ours. You are authorized by the Commission, for a certain period of time and on a shared party-line basis, the use of a specific frequency or frequencies for the public interest, convenience or necessity. On a secondary basis, you are permitted communications considered essential to the efficient conduct of your enterprise for which you hold a license. We recognized the first use but have we a complete picture of our secondary uses?

LOOK AT COMMUNICATION NEEDS—I think we should take a quick glance at our communication needs now and in the future. We seem to be able to accomplish with radio that which we could not do with wire and poles running down the back country road. It is a well known fact that the industry turned the corner some years back and that we are now dedicated to the task of growing trees for the future.

In this long range venture we are going to be operating over extensive areas and often in rough and rugged terrain. If this program, staged over millions of acres, is to succeed from a conservation and financial standpoint, we must improve management's ability to do the job better, faster and at costs that will permit a fair return for the risks taken.

A privately owned, well engineered radio system can be a big factor in attaining this goal. With an area type of coverage, you can bring about the closest possible coordination between executive and administrative personnel and the field crews throughout the vast territory you are managing.

ADVANTAGES OF RADIO—Field operations in our industry call for a flexible, reliable method of exchanging messages. While the equipment itself is somewhat complex, it must be easy and simple to operate. Those employing 2-way have had a smoother running organization. Many cases are on record of lives saved through faster action at scenes of accidents. Problems of a pressing nature that had to be dealt with after working hours or the next day are now disposed of on the job, or better still, when riding down the road in a vehicle. We now see that this radio tool is part of the answer to our communication needs.

A by-product, not too often recognized, has resulted in creating a "team consciousness" among the crew using radio. They see and understand for the first time that their job is important to the end results. Key personnel are kept better informed and able at all times to contribute their part. A man at the right time in the right place during an emergency has been able more than once to save the day.

This entire thought can possibly be illustrated at this time in this way. When hauling logs to the mill or to the market over several roads, it is conceded that full control can be maintained over an entire fleet of trucks provided approximately one-third of them are radio equipped.

A RADIO ON EVERY TRUCK—On one of my trips I found that the contractor was hauling logs a distance of 45 miles and employing 15 trucks, all radio equipped. His explanation was quite simple when I asked him, "Why all the radios?" At first he said he had only part of the trucks equipped with units but upon discovery that the trucks without radio were continually losing drivers and were on an average, not making as many trips, he installed units to see what would happen.

The plan was successful. The secret was in the fact that drivers without sets were not part of the team that knew what was going on. Drivers with radio had an extra importance. They were better able to contribute the uninterrupted flow of raw material to the mill. Radio facilities wired all drivers into the control room. It moved the outsiders into the company's bailiwick and as a result my informer kept all his drivers. No one would leave or take a truck on another job not radio equipped.

"INDISPENSABLE TOOL"—The old timers tell me that they do not see how they got along without radio. This has become a common saying. Whether the job is logging, supplying camp, fire fighting or general administration, we now recognize that radio is an indispensable tool of management. It even pays the bills.

Not too long ago one manager showed me a record he had given his directors on which he had figures to show that his system, in the first year of operation, had actually saved the company $12,000.

At one of our meetings last year, one committeeman commented that he dropped the payroll to the woods crew from his plane by prior arrangement over the radio. Yes, radio is doing today a job that has never been possible before. Our entire operations are geared to this unique tool.

USE IN WOOD PLANT—The fact is, it works so well in the field that we now find it employed in the wood processing plants. In plant use we see that it can be used to carry tone generated signals for the purpose of remotely controlling functions at some distance or in places hazardous to workers.

Of late, we have had our imaginations working overtime with the possibility of adapting the tv camera to forest fire detection uses. We now view remote operations over closed circuits in our manufacturing plants with industrial cameras. We might as well take the next step and televise conferences with participants in several different locations.

LIMITING FACTORS—Radio communication facilities that we now have, and on which the industry cut its teeth, have definite limitations. We cannot do some of the things just mentioned with 2-way. The limiting factor is the band width at these frequencies. With mobile radio we cannot carry many types of traffic. Our loading has about reached saturation.

These limiting factors have not brought us to the end of the road. All we need are bigger and better vehicles that will carry today's traffic. In making this change we do not want to begin over again. We want to keep our present mobile systems and use them; yet, we must build additional facilities that will handle all types of information at exceedingly faster speeds. Some have thought about going back to wire lines with its limitations, but that isn't the answer.

ANSWER IN MICROWAVE—The capacity to carry today's and tomorrow's communications can be successfully engineered on the latest ultra-high frequency radio relay systems we term microwave. When speaking of microwaves, we refer to bands which comprise wave lengths between one centimeter and one meter in length. This corresponds to frequencies between 300 mc and 30,000 mc.

Radio waves in the microwave por-

tion of the spectrum have wave lengths that most closely approach the behavior of light. We can think of them in terms of an invisible beam of light. They can be focused over substantial distances but the path must be line-of-sight. This is the reason that most microwave installations across country are established on high points or on mountain tops. Stations must be located with the purpose of eliminating any physical obstructions between transmitter and receiver points.

ALL COMMUNICATIONS TRANSMITTED—Over microwave circuits all essential communications of an enterprise can be transmitted. Transmissions are possible by voice, facsimile, teletype, telemetering, traffic control information and with multichannel circuits, permit "push-button" supervisory control of equipment at remote points or in dangerous places. A system can be designed with several channels or by multiplexing methods it may have 24 voice channels. If this many channels are not needed for voice, then each voice channel can be subdivided into from 15 to 18 teletype or telemetering circuits.

With signals beamed from one point to the next in from 20 to 50 mile "hops," this type of facility can be extended for hundreds of miles by providing automatic repeater stations. It is a common practice in a network of this type to provide party or private-line channels to plants or to the various headquarters or intermediate stations.

At relay stations, it is possible to tie in the mobile transmitters and receivers, and by so doing, extend 2-way radio coverage all along the system and even end to end. Network facilities engineered to handle mobile communications always reserve one or two channels for mobile use.

Microwave installations now in use have stood the test of reliability. They are not susceptible to outages caused by stormy weather. In addition such a system is versatile in that you can start with one or two circuits and as the demand for greater capacity arises, additional channels may be added. An important factor to remember is that with an increase in circuits the average cost per circuit mile decreases.

ONE FOREST INSTALLATION—Power utilities and pipe lines are leading the field in microwave installations. Broadcasting and common carriers probably come next. Some state agencies have now established microwave circuits allocating one or two channels to each of the government departments needing long-haul facilities. Forest industries have one such system licensed and in operation. It is owned and operated by A. J. Hodges Industries, Inc. The system connects the Shreveport headquarters to the company's field offices throughout the tree farm and ends some 90 miles distance near Hornbeck, La. There are six stations in all. The system operates in the 6000 mc band. This system provides circuits for all present tree farm communication needs. Later, when processing plants are added, more circuits can be provided at very little additional cost.

For some time four companies in our industry have held licenses for radio control microwave links employing the 950 mc band. The longest hop is 38 miles and is in the state of Washington. The shortest link is in California near Eureka and is for a distance of 7 miles. These links take the place of wire lines to the top of the mountain. They provide a means of carrying the voice to the top where it is then retransmitted over the mobile frequency.

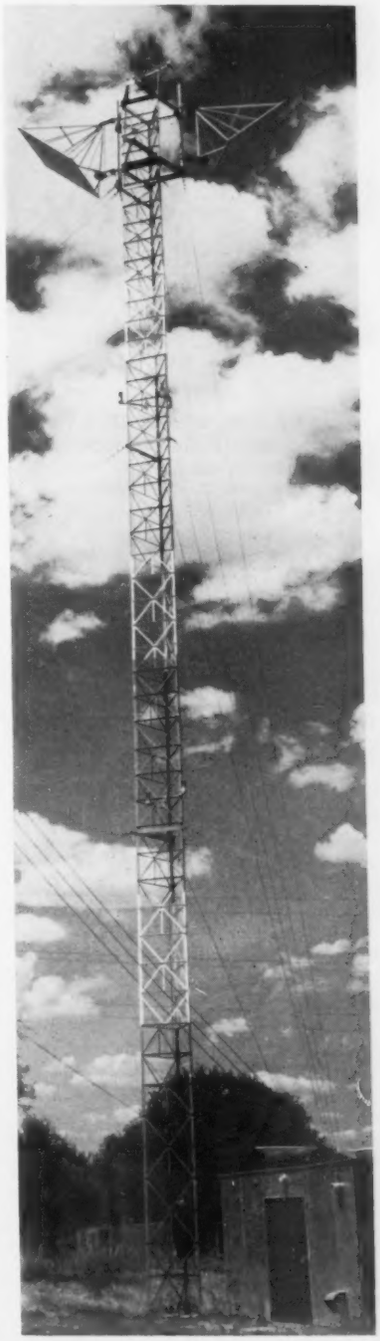
GOOD ENGINEERING NEEDED—Microwave communication is a highly technical field requiring good engineering in laying out systems and in making the installations. Care must be exercised in selecting station sites. Equipment of the right order must be selected to assure private-line operations on a simultaneous, bi-directional basis without the necessity of a large amount of duplication. With proper engineering, a system can employ some land lines. Special consideration must be given to stand-by equipment and auxiliary power supplies in case of power failures.

Bands for microwave service have been set aside by the Federal Communications Commission in several portions of the radio spectrum. At this time, we do not have rules governing this type of service but licenses are granted for developmental purposes on a case-by-case basis.

Last year the radio committee of the industry took part in FCC-Industry-Manufacturer conferences for the purpose of rough drafting rules for a microwave service. These conferences were highly successful. As a result, additional information has been collected and supplied the Commission and steps have been taken to write rules that will not be restrictive as to types of information to be transmitted over such networks.

Telephone common carriers see a direct threat to long-haul wire line facilities and in conferences held they opposed most liberal measures suggested by the industry.

INDUSTRY IS ELIGIBLE—Under our current Forest Products Radio



MICROWAVE TOWERS, such as this, beam signals from one point to the next in from 20 to 50 mile "hops," permitting network to be extended for hundreds of miles. First microwave system in the forest industries is that installed by A. J. Hodges Industries, connecting Shreveport headquarters with Tree Farm field offices through a 90-mile area.

rules, we are eligible to use, on a shared basis, microwave frequencies in all the non-government bands. In order to strengthen the mobile service's position in this field, there has been formed what is known as the Microwave Users Council. In this Council we have banded together all the major using microwave industries. It meets once a year to review progress and chart the course for the following year. It is very similar in function and operation to our Forest Industry Council.

Today we do not look for the time that our vexing communication problems can be solved by some new device. That new device is here and available to you for your use. It is unlimited in its carrying capacity. Flexibility and reliability are its main virtues. That it will permit central administrative control over larger and larger areas and do it at reasonable costs, is a fact. Why not look into the possibilities of applying microwave facilities to your communication needs.

"CFI"—Why Most Big Companies Use It

How Gaylord accurately inventories timber by statistical sampling through permanent plot locations

By T. A. SPAIN JR.
International Business Machines
Baton Rouge, La.

● To best evaluate the present position of continuous forest inventory in North America today, I think it would be well to discuss the history, procedure, costs, present status, and some conclusions. These five points will perhaps present the clearest possible picture of the application.

HISTORY—As most of you may know, "Continuous Forest Inventory" —or CFI, as it is commonly called— is a method of inventorying timber holdings by statistical sampling through permanent plot locations. As I understand it, the concept of permanent plots is not new, but one that has been popular in Europe for many years. However, it has not been extensively used in the U.S., except for growth calculations, until the past few years, when it was applied as a basis for very accurate inventory determinations.

I think it is fair and reasonable to state that this application to inventory through permanent plots really got rolling with the development of the IBM Mark Sensed Card, and that this development has played a large part in the rapid growth of CFI in the past few years.

Mark Sensing provided not only an accurate live unit record but also eliminated the costly step of manually transcribing and checking the field recordings of the forester that is necessary with key punching to the punched card or other tabulating media.

PROCEDURE—Although I have seen and read about many CFI jobs, my personal experience has been limited to that of the Gaylord Division of Crown Zellerbach Corp. in Bogalusa, La. I know of no better or more detailed job than Gaylord's nor of any company that lets the information obtained work for them as extensively. Therefore, since most procedures are generally the same, I have chosen the Gaylord job for this illustration.

They own and manage approximately 500,000 acres of timberland, already had adequate maps and aerial photographs, and established and maintained their inventory as follows:

Procedure to Establish: (1) Determination of number of plots to establish. (2) Locate plots geographically on maps, photographs or both. (3) Train field crews. (4) Physically locate the plots and permanently mark or identify trees. (5) Record (by mark sensing) detail measurements and other desired information for each tree. (6) Automatically punch all tree cards. (7) Calculate individual tree volumes (cords and sawtimber). (8) Sort and tabulate desired reports.

Procedure to Maintain: (1) Annual remeasurement (based on desired cycle). (2) Growth calculations (comparing successive diameter measurements) (3) Sort and tabulate desired reports.

COSTS—I have seen cost figures quoted on at least a dozen different CFI jobs, and they have ranged from 3¢ to 12¢ per acre. However, I think it best to define costs before figures are quoted. In all cases, in the range quoted above, cost of field crews are included, and in some cases mapping and photography are included.

Quoting costs by acre is dangerous because it will be directly proportionate to the number of plots established, which will be determined by the statistical degree of accuracy desired on the individual components of the total holdings. I prefer to compute costs on a per-plot rather than a per-acre basis, differentiating between plot establishment and plot remeasurement.

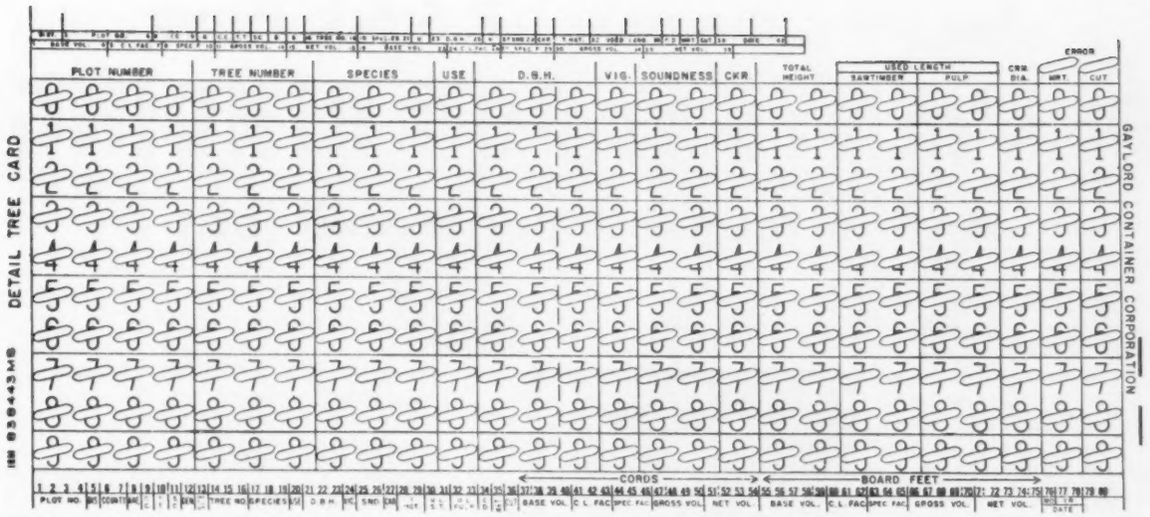
There are some interesting facts available from the Gaylord job that might be helpful in evaluation of any CFI job. They chose to use the 1/5 acre circular plot, and established 2,500 of these. This resulted in the original measurement of 75,000 trees and preparation of 75,000 unit records (IBM Mark Sense Cards).

They found that 80% of the total cost was in field work, 10% in office preparation, and 10% in IBM costs. Their plot production per two-man crew was 3½ to 4 plots per day on establishment, and 6 to 8 per day on remeasurement. I have computed their per plot cost and find it to be among the lowest of the jobs I have heard quoted.

PRESENT STATUS OF CFI—Due to the lack of a central clearing house or reporting procedure, it is difficult to determine the exact status of this application at any given time. However, based on inquiries throughout the South and information from Cal Stott of USFS in Milwaukee, it is possible to make some reasonable estimate of the status.

In the South most of the major pulp and paper companies have gone to IBM CFI, and, as far as I can determine, seem to be most pleased with the results. These range from 3½ million acres to 5,000 acres.

In the Midwest or Lake States, where the system was conceived and developed under Cal Stott's guidance, the greatest progress and experience



IBM DETAIL TREE CARD used by Gaylord Container Corp. to maintain continuous inventory on approximately 500,000 acres of timberland. Some 75,000 cards record detail measurements and other desired information for 75,000 trees in 2,500 plots.

has been realized. Here, too, most of the major companies are using this system.

Recent progress has been made in the East or New England States, and there are two large jobs underway there now.

Little information is available to me about progress on the West Coast, but I understand that only a limited amount of work has been done.

Another important region where great potential exists is Canada. Government requirements for information on privately owned land make the IBM method most attractive here. Several jobs are presently underway here and I believe it will be one of the largest markets for CFI.

The best figures available indicate that there are presently about 30 large companies included, that there are over 20,000,000 acres under CFI control, and that 1,000,000 trees from 30,000 permanent plots are recorded on individual tree cards. Three-fourths of this work is on industrial forest land, one-fourth on public lands.

I mentioned earlier the small job of 5,000 acres. This is a private ownership on which 500 plots were established, and the owner is most pleased with the results and cost thereof. He knows more about the composition of his ownership than many owners 100 times larger. So there seems to be no limitation on size to make this job practical.

CONCLUSIONS – The experience gained in the past few years with CFI permits us to draw certain conclusions.

(1) CFI has been successful, and is presently providing information about timber holdings previously unknown. By mathematical and physical checks it has proven to be an accurate, economical, and simple means of inventorying timber.

(2) The system is built on a definitely identifiable base which eliminates the omission of forest conditions. This tree base instead of a land base means that we now know what individual trees are doing.

(3) Mark sensing works well in the woods, and can be justified on clerical savings alone, not counting the reduction of errors resulting from the elimination of clerical transcription.

(4) The live unit record produced can be processed at machine speeds for any desired sequence of data. This means greater flexibility, making it practical to get more information and possible to change the unit of measure mechanically at any time to conform to varying units or desires.

(5) Takes the forester out of the office, and puts him back in the woods, where he performs the job of technical analyst, for which he was hired, rather than that of an arithmetical clerk.

(6) Most important of all, is to let this information work for you to its maximum ability. Consideration should be given to using CFI as a base for woods management. Here is a detail record on which an operational plan can be built, forecast and checked. Inventory alone will certainly justify the system, but in my opinion it is a waste of good information not to use it further. Take advantage of the data which the inventory has provided, and learn some of the hidden secrets of your woods.

IBM IN PULPWOOD PROCUREMENT—Another IBM application in the pulpwood industry which should be of interest is "Pulpwood Procurement or Settlement Accounting." This is another area in which IBM has facilitated the work of the pulpwood industry in recent years. Here again the Mark Sense Principle of automatic recording is employed to reduce clerical effort.

In accounting terms this is an accounts payable application for the purchase of pulpwood from outside sources or contractors. Procedure-wise, each contractor is given a permanent number or code. As each truck comes into the wood yard, the scale man marks an IBM card with the total weight of the truck and the contractor's number. After unloading, the truck again passes the scales where the weight is again recorded. From this point on, the accounting is completely automatic.

The cards are automatically punched, wood weight is determined, volume factors are applied to this weight to compute volume. The volume is then priced and extended, and these cards are then used to write the checks and vouchers to the contractors. In addition, and a most important by-product, the cards can be then used to prepare special statistical reports on pulpwood procurement by any desired classification, and wood yard inventory.

This is a fairly new application, but one which can benefit any company that purchases large volumes of wood.

The best job of pulpwood procurement accounting that I know of is that of Brunswick Pulp and Paper Co. in Brunswick, Ga. They are very proud of this application, and have stated that they will be glad to have anyone interested visit their installation.

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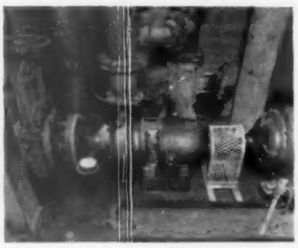

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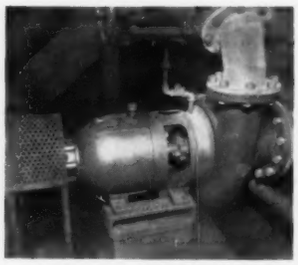

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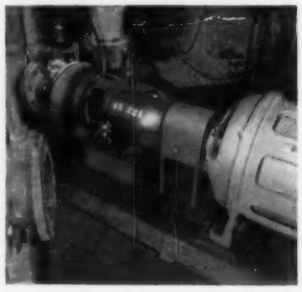

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Multiple Use of Industrial Forests

(L to r) GORDON B. BONFIELD, American Boxboard Co.; BERNARD L. ORELL, Weyerhaeuser Sales Co.; PAUL M. DUNN, St. Regis Paper Co.

Forests Aid Fish and Game Resources

How American Box Board channeled good forestry practices to greater benefit of deer herd and also better forests

By GORDON B. BONFIELD
American Box Board Co.
Filer City, Mich.

• To some the term multiple use might conjure up some visions of an Utopian arrangement whereby an infinite amount of things could be accomplished with a given piece of land. This indeed would be Utopian. So we must agree on a more practical definition like—"two or more uses for a single piece of land, usually with one use predominant." My statements concern our management of land in the fulfillment of (1) pulpwood supplies and (2) deer herd and range improvement.

The American Box Board Co., among other activities, owns and operates a pulp and paper mill at Filer City, Mich., producing approximately 400 tons of corrugating medium daily using the neutral sodium sulfite semi-chemical process. Our raw material is aspen or "popple" and we consume slightly in excess of 500 cords a day. We are but one of 7 mills in the Lower Peninsula of Michigan using a grand total of 300,000 cords annually.

A good share of the aspen lands in Lower Michigan are publicly owned and private lands of any acreage are "tightly" owned, making it virtually impossible for us to acquire sufficient acreage of our own in large enough blocks to be suitable for intensive aspen management. Consequently, we have had to resort to all sorts of means to tie up enough privately owned land on lease or contract basis in exchange for forest management services to meet our current needs and provide for a continuity of supply for our future needs. One phase of this approach is the subject of this report.

A BIT OF HISTORY—Our present wood procurement activities are the result of a series of events dating back to the middle of the 19th century so a little history seems to be in order. When the white man arrived on the scene in Lower Michigan there were approximately 6 million acres of the pine type. By nature the pine type is deficient in both food and cover for deer, consequently these animals were relatively scarce during this period.

The logging of the famous Michigan "pineries" and the following spectacular slash fires caused the virgin pine areas to be re-stocked with dense stands of hardwood brush. This meant a superabundance of food for the deer herd and they multiplied and spread rapidly.

This increase had its fluctuations but the upward trend continued until a peak of over 1,000,000 animals was reached during the early '40s. This magnificent deer herd—the largest in the world—has been both a blessing and a curse. Although it has provided excellent sport and food for many years its under-utilization has caused appalling damage to reproducing forests.

Millions of acres of young forests provided ample food 20 or 30 years ago but the large herd was literally left behind when these forests grew up out of reach. The deer then focused attention on secondary under-story plants and methodically overbrowsed most of Lower Michigan.

DEMISE OF PINE—The extensive pine type is now non-existent since the great fires of the first 20 years of this century killed most of the reproduction as well as the seed trees. In their places have persisted the fire tolerant species like aspen and jack pine. Today below the Straits of Mackinac we have approximately 3,000,000 acres of aspen on former pine sites.

For many years aspens were considered a weed species of no commercial value and much was attempted to convert these stands to forests of merchantable quality. The "detestable" aspen lands sold for as little as 25¢ per acre. Much land of this type reverted to public ownership because of tax delinquency, and thus a large part of the state and federal forests were formed.

With no sizable market for aspen wood, forest managers were finding it difficult to practice sound, practical forestry. Millions of cords of aspen were maturing with no prospect of substantial harvests as late as 1945.

During this period the container industry was manufacturing its corrugating medium (called 9-point in the trade) from straw. In the '40s changes in farming practices and national economics caused straw to become increasingly scarce and more expensive. Industry was much concerned and began, with the help of existing public and private research agencies, the search for an economical substitute.

DISCOVERY OF ASPEN—Eventually the locally available aspens were discovered as having exceptional pulping and processing qualities. When the

THICK STAND OF YOUNG ASPEN SUCKERS provides over a ton of tender twigs per acre for deer food.

SIX YEARS AFTER CUTTING this young aspen stand is still supplying a lot of twigs and leaves for deer.

necessary technological problems were surmounted the once lowly aspens were "skyrocketed" into economic prominence.

Pulp mills were constructed or converted and aspen logging proceeded at an alarmingly rapid pace, doubling and redoubling each year. Although over 300,000 cords of aspen were harvested in the Lower Peninsula during 1955, the "leveling-off" is not expected until the 500,000 cord mark is reached. This is a real "Cinderella" story for aspen!

NEED FOR DATA—Soon after industry's entrance into the aspen pulpwood market it became strikingly evident that the long neglect of the "weed species" had allowed for a paucity of information concerning the silviculture and management of this forest type. Consequently, with the cooperation of the University of Michigan our company initiated and the pulpwood-using industries in the Lower Peninsula supported a basic study of the aspens.

This work has not yet been reported in final form but enough preliminary data have been released to measurably aid those concerned with aspen management. In fact, we feel we now know enough about aspen to proceed in an intelligent, scientific manner. Most important we know that with proper treatment aspen forests can meet our industrial needs for as many years as we can see into the future.

DEER HERD AIDED—Among other interesting and important findings this research demonstrated that the Michigan deer herd was being tremendously aided by virtue of the choice food in the form of the tender and succulent sprouts that so rapidly regenerated the cutover areas. American Box Board Co. carefully weighed and evaluated these data and eventually developed a program that provided for a high degree of multiple use in the aspen type.

Under this plan the aspen forests would be harvested and regenerated and the deer would be materially benefited in terms of food and cover. In effect, the large-scale aspen harvests have regenerated the Michigan forests not unlike the fires of a few years back. Consequently, the deer are again supplied with adequate food and cover in many places.

This program has been of special interest and significance to landowners in the northeastern corner of the Lower Peninsula. Here an almost contiguous block of 500 sq. mi. is made up of private clubs devoted to hunting and fishing. For years they have guarded, preserved and nursed along the forest and wildlife resources.

However, the pattern here has been the same. The young forests of a generation ago have matured and the deer have been overbrowsing in the understories. Malnutrition of deer has been common since the mid-'30s and hard winters have brought severe starvation losses. Proper food and cover is lacking everywhere.

FEEDING PROGRAMS UNSATISFACTORY—The clubs were much concerned and initiated various means of feeding the herd. Feeding programs with hay, alfalfa, clover, cereal grains and vegetables have been tried. These are expensive and have not proven satisfactory in most cases. Small scale cuttings were made for tops and sprouts but the large herd minimized this effort too. All in all both the quality of the forests as well as the hunting has deteriorated.

American Box Board's program of forest and wildlife management has provided the means whereby the clubs can accomplish their objectives. Further, the aspen harvests are accomplished at a profit rather than a loss since the stumpage represents forest revenue. And further, the coordinated action of the clubs allows for large-scale cuttings which means deer habitat improvement on a wholesale basis.

The company, on the other hand, receives the pulpwood, but, more important, overmature and decadent aspen stands are being harvested and regenerated. If they were not cut the stands would die out and the areas would be lost for future production.

COMPANY AIDS CLUBS—In addition to supplying a steady market for the pulpwood, the company provides all the necessary technical information and assistance to properly manage the clubs. After inventorying the forest resources a detailed management plan is prepared. The features of this plan are basically predicated on improvement of the club in terms of wildlife and recreation. This phase of our work is headed up by our own full-time wildlife biologist who is successfully convincing these sportsmen to initiate the planned, scientific program of the company.

Possibly the details of operation can best be explained in terms of this specific example. In this area a large ownership of 26,500 acres is known as the Turtle Lake Club. It was formed in 1873, and is the oldest existing hunting club in the state of Michigan.

The club has been left with a large population of deer, 80 to 100 animals per square mile, and a noticeable lack of proper deer food. Consequently, the size of the animals is small and the racks as reported by the hunters are also very small. The benefits of an aspen pulpwood operation were explained to the club and they decided to enter into a long-term agreement with American Box Board Co.

CASE HISTORY—A survey of the forest resources showed that the club owned approximately 10,000 acres of aspen land. A management plan was developed, whereby an equitable amount of pulpwood would be removed each year over a period of 20 years. This means that 300 to 700 acres will be cut annually. The first year's operation has yielded over 5,000

cords from approximately 850 acres.

This operation started in Feb. 1955, and continued through the rest of the year. The response of the cutover areas in terms of new growth was typical and the deer were supplied with a tremendous amount of food. Of no less importance was the large amount of browse in the form of treetops during the winter.

The deer responded nicely so that this past hunting season records showed that the animals were 15 lbs. heavier on the average and carried 3 to 4 more points per rack.

Preliminary observation indicates that the objectives of the plan in terms of deer food and deer habitat improvement have been satisfied; however, the large deer herd has removed an alarming amount of the young shoots of aspen and many areas have been completely denuded of young trees.

NEED FOR CONTROL—Our attention now is directed towards measures that will control the deer herd and insure adequate forest reproduction.

Research has shown that any commercially harvested aspen area provides a tremendous amount of food—as much as 1½ to 2 tons of browse per acre. Further research shows too, that ¾ of the number of young shoots may be given to the deer herd without jeopardizing future pulpwood.

If, however, the deer take more than this, then either the deer herd has to be controlled or cutting operations changed. In this example we know that the herd is much too large for the ability of even the cutover forests to supply food. It is hoped that the club will be allowed to enact the proper control measures, namely to remove more deer.

This program of forest and wildlife management has proven to be mutually beneficial for both the company and the Turtle Lake Club. The company has gained a supply of pulpwood now, but, more important, it has reasonable assurance of future supplies. Also, this acreage under management can be made to produce even greater amounts of aspen pulpwood in the future since the low-volume, decadent aspen stands will be cut and put back into full production.

SUMMARY—The history of aspen utilization in Lower Michigan would go something like this: when aspen utilization was still in its infancy in the Lower Peninsula the American Box Board Co. as well as other wood-using industries, inaugurated a research program at the University of Michigan.

This study, known as the Aspen Study, Michigan Memorial Phoenix Project No. 29, was started in the spring of 1951 and completed in 1953. This information plus what had been known about the aspen tree in Lower Michigan was assembled and reported.

The sponsoring industries under the leadership of American Box Board met with the university and public agencies in an attempt to agree on future policy and practices with aspen in light of the new knowledge and increasing utilization.

Our company then proceeded to develop its program according to the findings. In addition, industry also popularized and published some of the salient points of the report. Our "Deer and Aspen" publication is largely the result of this integration. The data showed clearly that much could be done for wildlife through commercial forestry.

Our company entered into a program of education whereby club owners were contacted and informed of the results and the extent of the company's interests. Eventually agreements were formulated with some of the clubs. Subsequently, resource surveys were completed on the clubs and management plans were written.

Today American Box Board Co. is supervising cutting according to the management plans on several of the clubs and the movement is growing. The company purchases the pulpwood at the going rate for wood of similar quality. In addition, we are carefully watching and appraising the situation in terms of its effects on both forests and wildlife. Certain adjustments have to be made from time to time since in many respects we are engaging in operations which are new to the club country.

CONCLUSION—We realize the arrangement between the hunting clubs and American Box Board Co. is unique. However, it is mutually beneficial and we see no reason why the arrangement can't continue.

From the company's standpoint, the arrangement at the present time is an expensive one, both in terms of manpower and money, simply because a large staff is necessary to provide the services for which we have committed ourselves. And secondly, because as previously stated, wood is not presently scarce in Lower Michigan, but at the present rate of decadence and the increased rate of utilization, aspen pulpwood may very well be scarce in the near future.

Also the club country represents many thousands of acres of aspen forest land that without proper management or utilization would go to waste. When aspen stands are allowed to die out, they do not replace themselves. This would then represent a loss to the landowner in terms of a forest and revenue; it represents a loss to the deer herd in terms of present and future supplies of browse; and last, but not least, it represents a loss to the pulp and paper industry in terms of present and future supplies of pulpwood. Since the hunting clubs are primarily interested in the deer herd, it is very fortunate indeed that deer and aspen management are so compatible.

Private Forest Use for Public Play

How Weyerhaeuser Timber coordinates private forest management with permissive public recreational use

By B. L. ORELL
Weyerhaeuser Sales Co.
St. Paul, Minn.

● The subject of multiple use of private forest lands is a very important one in these times. Recreational use of all wild lands is increasing tremendously each year. It is also important because there has been a development over a period of years of the publicly accepted theory that multiple use is an adjunct of governmental ownership of forestlands.

WHAT IS MULTIPLE USE?—Multiple use of forest land through the maximum utility of every acre has

long been the objective of all foresters, whether public or private. Webster defines the word, "multiple," as meaning "more than one." As applied to forest land, simply stated, it is the use of a given area of ground for more than one purpose. Any given acre devoted to the growing of trees on which there is any other use, is also devoted to multiple use.

There are many individuals and organized groups in this country today promoting the idea of total governmental ownership or control of forest lands. Their principal justification is that such ownership or control is necessary to the practice of multiple use.

They state arbitrarily that the term means the use of timberland not only for the growing of trees, but for watershed purposes, recreation, hunting, fishing, grazing, and all of the other elements which conceivably may be applied as a single use to the same acre. Specifically stated, this concept means there must be all uses on all lands before the multiple use objective is reached.

TREE FARM LAKE. Besides supplying regular wood harvests, well-managed Tree Farms have recreational values. Shown is Lake Perrault on Copper Range Co. Tree Farm, near Houghton, Mich. Wise woodland management and water conservation go hand in hand. (Photo—American Forest Products Industries.)

NOT ON FEDERAL LANDS—If this definition is accepted for the moment, then we do not have multiple use on federal lands. This is not said critically, but with recognition of areas administered by the USFS, the Bureau of Land Management, National Park Administration, and the Indian Service, which are devoted to only one major use.

Some other uses may be a natural part of the administration of these lands, but not all of the uses possible are applicable to each area. There are under the direction of the federal management agencies, lands which are devoted entirely to recreation, such as camping, picnicking, etc. There are other lands devoted entirely to the growth of timber for harvest, and still others strictly to scenic value, with no harvest of any kind intended, or even considered possible.

Therefore, on any given area or any given acre administered by federal or state government, multiple use, as it is too commonly defined, is not actually a fact. It is to be emphasized that this is on the basis of the mistaken broad concept of the phrase "multiple use" as it is used all too frequently in the press and in magazines.

Under the true definition of the term, it is a categorical fact that any forest land being managed wisely for the harvest of successive timber crops is devoted to multiple use. Such management is based on adequate fire prevention and control measures. It involves systematic harvest, either by clear cut or tree selection methods. The absence of uncontrolled fires, coupled with intelligent harvesting of the timber crop provides sound watershed management as a natural by-product, prevents the destruction of game, the pollution of streams, the desecration of scenic values, and the destruction of nature's beauty spots. Systematic harvest permits the growth of forage for game.

SOIL IS PRIMARY—Anyone giving considered thought to the interrelationship of the various aspects of our nation's natural renewable resources, knows that soil is primary to all other resource programs. The soil, along with forests, provides the habitat for game, large and small; the streams and lakes for fishing; much of the water for industrial, domestic, and recreational use; and outdoor facilities for public relaxation.

The management of any one phase, when carried to the extreme, without recognition of the total resource, would inevitably be detrimental to any one, or all, of the others. The carrying capacity of a given area for big game could be greatly enhanced by the complete removal of all timber, followed by successive burning. Such a practice, however, would be extremely undesirable from the standpoint of watershed value, other recreational attributes, and the economics of the region dependent on continuing crops of trees.

Therefore, any scientifically managed forest property in private, state, or federal ownership, is a multiple-use managed property.

Private industry can sell this concept to the public through the recreational uses of its lands. A business, whether it be one operating in the field of resources, in some phase of retailing, or any other that one can call to mind, is not operating in a vacuum. The customers are people from all walks of life. Its employes are individuals who do many things with their time beyond that spent earning a living.

PUBLIC ACCESS IMPORTANT—Public access—what does it mean, what does it imply, what does it accomplish? When he opens the lands for which he is responsible to such access, the land manager is faced with the well recognized risks of fire, as well as damage to roads, equipment, and facilities. It is a natural reaction to ease the management load by excluding Mr. John Q.

Arbitrary exclusion of large areas without a sound explainable reason is likely to have serious repercussions with customers who buy forest industry products, and may bring a drive for undesirable legislation, the passage of which would be bad for industry and the public.

The decision as to recreational use of private land is an important one involving expenditure of money and time, nuisance to employes, and danger of motives being misunderstood. Before the policy is established, certain fundamental considerations must be taken into account.

The first is that industrial forest land is devoted to the growth of trees

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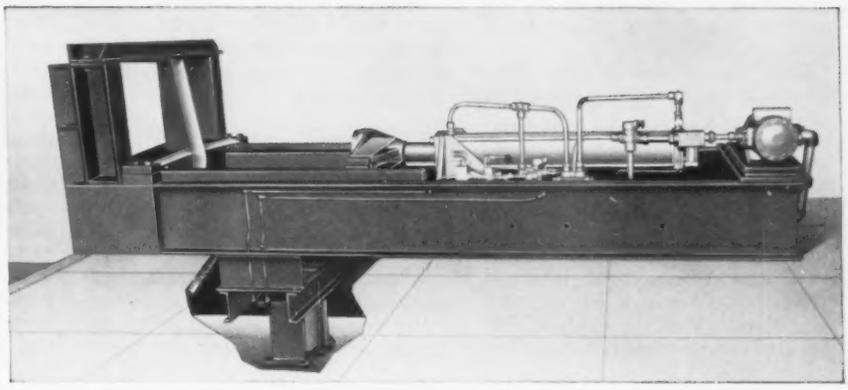

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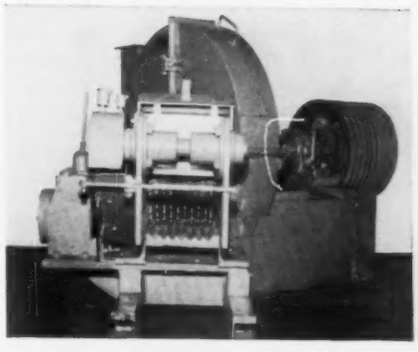

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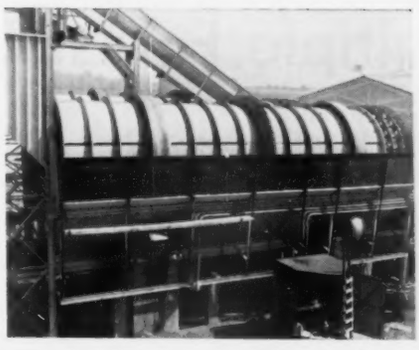

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for harvest, to be converted to products for public consumption to maintain and raise our standard of living. On a large area, base recreational use can never be the paramount consideration on such lands. As an economic "fact of life," this consideration must be realized by everyone looking forward to any use of private forest lands.

Other uses of private forest areas are compatible with systematic timber harvest.

Utilization for other purposes of forest areas devoted to timber cropping is a "privilege" to be granted, not a "right" to be taken without authorization.

The pressure for outdoor recreational activity has grown tremendously since the war. It has assumed proportions beyond the ability of federal lands to carry the load, particularly in the East, South, and Midwest.

PUBLIC RESPONSIBILITY – The company or individual administering large areas of so-called "wild land" does have a public responsibility. This is due to the fact that such administration affects not only the company interest, but the community, its citizens, and thousands of others, many very remote as regards direct company contact.

The average citizen considers unfenced land to be "his land" and therefore open to access at all times. This has developed from pioneering days when the forest provided shelter, fuel wood, materials for construction, and food. Freely available due to over abundance, even today most feel it a "right" to cut Christmas trees when and where they will.

Restriction of access on a large forest property is an impossibility. Total restriction costs money, time, and inconvenience. It breeds public contempt for law, just as did liquor prohibition. It also breeds deliberate reprisal in the form of fires, equipment damage, etc.

From a practical standpoint, a company should never underestimate the potent force politically that organized sportsmen, conservation, and outdoor groups can take.

REASONABLE ACCESS IS WISE– These, then, are the factors that must be considered when decisions are being reached regarding the problem of general access to a given forest property. It is my belief that the land manager who carefully considers all of these factors can come only to the conclusion that it is wise policy to permit access on a reasonable basis.

It is a fundamental principle of human relationships that individuals respond favorably to a direct approach, sincerity, facts, and interest in their problems. If people are permitted to enter areas which are not being actively operated during periods when the fire danger is not acute, or into areas that are relatively fire-safe, tough restrictions on danger areas can be imposed and will be respected without much policing effort.

The net gain is the recognition of the company as an interested participant on the community scene and the further development of public fire-consciousness. Most important is the development of recognition of access to private land being a privilege and not a right.

From a pure public relations standpoint, there is no better means of selling recognition on the part of the individual citizen of the fine stewardship of wild lands that is being carried on by the individual company and by private industry, generally.

SOME MULTIPLE USES–When one thinks of multiple use of forest lands, hunting, fishing, and watershed values stand out immediately. Less spectacular but nonetheless important are camping, berry picking, sight seeing, hiking, bird watching, and many others. All of these are a consideration in land management plans of Weyerhaeuser Timber Co.

Camp grounds in natural beauty spots, conveniently located at natural gathering places, concentrate people in areas that can be made fire safe. During periods of reasonably safe weather conditions, entry to non-operating areas is permitted for fishing, rough camping, bird watching, hiking, and berry picking.

A signed permit provides a record, imparts a feeling of responsibility, and provides a favorable contact between company representative and the individual recreationist. Roadside strips leave intact the forest corridors along main roads and those important for scenic value.

All of this costs time and money. It creates headaches. There is considerable road damage at times, and limited but distressing examples of damage to equipment.

The gain? On a regulated basis, people are brought into field contact with private forest management. It is my belief, and that of my company, that such contact is the most concrete means of developing a real public recognition of the efficacy of private enterprise as applied to resource development.

Multiple Forest Use in Practice

How St. Regis Paper has encouraged sporting and recreational use of its forests, and received benefits in return

By PAUL M. DUNN
St. Regis Paper Co.
New York, N. Y.

● Through the years, there has been a varied, often erratic, pattern of forest land use. From free and unrestricted use by the cavemen to the very restricted use by the feudal lords in the Middle Ages, we have had until recently a policy of multiple use on most public lands and one of single-use on most private lands.

The trend is changing now, because of greater experience, the pressure of the public interests, and a better appreciation of community responsibilities on the part of the landowners.

Most private timberland owners are willing to accept the multiple use philosophy, and recognize the related values on their property in the production of water, game, fish, and recreation.

However, it is often a bit difficult for them to understand why the private lands should provide full multiple use by the public, and many of the public lands be restricted to limited use. The present trend on the part of most private landowners is to let the public use their land with certain controls.

MULTIPLE USE AS PRACTICED—The forest management programs of many operating timber companies, both lumber and pulp producers, show that the principles of multiple use are being practiced in most sections of the country. For years, segments of our industry have been aggressive in the acceptance of this responsibility for the community and public interest.

I will say, also, that the pulp producers are out in the lead in this respect as they are in many other aspects. There is considerable evidence that these various modifications to strict timber management have accrued actual monetary returns as well as the expected abstract values.

In order to be specific, I shall cite the experience of St. Regis Paper Co., which is no different than that of many other timberland-owning companies. I refer to certain projects and activities which have been interjected into the forest management program of our lands.

These projects have all modified the primary use policy of pulpwood production, but have been accepted graciously.

MANY BENEFITS—I assure you, that the modifications have not been considered as debits, entirely. There have been many benefits from the grants of land, construction of dams, location of camp grounds, leasing of cabin sites, designation of game areas, building of roads and reservation of timber tracts.

All of these measures have entailed commitments of company time and budget in the planning and the actual administration of the program. They are active projects and must be considered currently. The associated uses of the woodlands, as well as the pulpwood harvest, must be anticipated.

St. Regis Paper Co., with its pulpwood operations in four major timber areas of the United States—Pacific Northwest, Lake States, South, and Northeast—as well as Eastern and West Central Canada, comes in contact with about all the various types of forest land use.

However, recreation, including hunting and fishing, and water use predominate as the activities that are considered along with timber production in the planning and management phases of our lands, totaling more than four million acres.

This multiple use of the timber lands is an accepted company policy and in the majority of instances is an integration of uses. Through the years, the advantages of growing game, fish, water, recreation and grass as well as wood are becoming more and more evident. Perhaps the most evident return is the favorable reaction of our neighbors in the communities and other periodic guests; the hunters and the fishermen. Like entertaining any neighbor or guest, some specific attention is involved and quite often some expense.

REGIONAL USES—In the Pacific Northwest (western Washington), water and recreation are the primary associated uses. The lands are not posted and no serious problems exist in respect to camping. The Lake States area is similar.

In the South, there is only an occasional need for consideration of uses other than timber cropping. The water and recreation aspects are minor. On the leased lands, the owners retain the hunting privileges.

In Canada, especially in Alberta where the land is all leased, definite plans are being outlined for consideration of the recreational and water aspects of the timber lands.

The timber will be cut to facilitate snow retention on and water absorption in the soil. The planning and construction of the roads will give emphasis to water and soil conservation. The timber will be left in the stream bottoms, as well as on 300-ft. strips bordering the streams, the major resort lakes, highways and access roads. Hunting and fishing are not restricted, but closures may be imposed during high hazard fire periods.

In New York State, timber production is not too active; however, the entire 142,000 acres are used for hunting and fishing on a lease basis. The leasing of the lands provides interested users who discourage trespassing, some road maintenance, fire protection, and a good share of the tax money. Currently the income from this source is approximately 27% of the total return, annually.

IN NEW ENGLAND—In the state of Maine, with more than 650,000 acres, the area is opened to many forms of use, though much of it is leased for hunting, fishing, and camping. Specific measures have been taken by the company to cooperate with the state in respect to the Atlantic salmon runs in the Machias River and the run of alewives from the Orland River into the Alamoosook Dam. Two new, improved-type fish ways have recently been constructed at some expense and are functioning satisfactorily.

The New Hampshire-Vermont Division of St. Regis is strictly a woodlands unit, with about 325,000 acres of timberland; 192,700 acres located in Coos County, N.H., and the balance in Vermont.

St. Regis acquired the greatest part of these forests in 1926 from Connecticut Valley Lumber Co., or the C.V.L., as it was commonly called in this region. However, a large area of Vermont lands came from the New Hampshire Stave and Heading Mill, a sugar refining company subsidiary.

FIRST CUT IN 1868—The first recorded cut on the C.V.L. (now St. Regis) lands was in 1868, although some land clearing had been done before. In this year, a large cut of spruce logs was made on lower Indian Stream and driven to Holyoke, Mass. By 1870, there were very extensive cuttings in Clarksville and Pittsburg, N.H., near Cedar Stream and Deadwater River.

Long-log drives of 50 to 100 million ft. were common in those days, but the last strictly long-log drive was in 1915. Since then 4-ft. wood, peeled and rough, has been driven down the Connecticut to various points as far as Bellows Falls.

The first record of hardwood logging on these lands shows that the owner, George Van Dyke, gave 2 million ft. of hardwood stumpage to Beecher Falls Manufacturing Co. in 1888, as an inducement to get a furniture factory established at Beecher Falls. This timber was cut in the following two years on Hall Stream.

ROADS OPEN UP LANDS—In recent years, truck transportation has changed the logging picture and about 150 miles of gravel roads have been constructed since 1941. Uncounted miles of winter or dry weather roads have opened up the lands as they never were before. Today it is unusual to have a logging camp which cannot be reached by automobile.

In 1954, there were operations on St. Regis lands in Pittsburg and Clarksville, N.H., and East Haven, Victory, Averill and Canaan, Vt., resulting in a cut of 20,000 cords of sap peeled spruce and fir, 5,000 cords of chemically-debarked spruce and fir; 8 million ft. of hardwood and ½ million ft. of softwood logs. Further salvage of 1950 blowdown timber produced some logs and rough pulpwood, while a few hundred cords of birch boltwood were cut in Averill, Vt.

These St. Regis lands are being managed primarily for pulpwood production. However, the multiple use policy has been maintained from the outset. Located as they are, principally at the head of the Connecticut River and against the Canadian boundary, they are "great north woods" to many sportsmen from further south in New England.

ENCOURAGE MULTIPLE USE—Realizing that sporting and recreation uses of the forests are not necessarily a serious hindrance to timber production, and on the contrary furnish very desirable seasonal employment to a large part of the voting population of the area, our company has, since acquiring the lands in 1926, been quick to cooperate in every practical way in not only maintaining this multiple use, but also has encouraged the expansion of it.

There has been developed a highly beneficial degree of good public relations with the local population, and at least a reasonable degree of acknowledgment of our efforts by the out-of-state sportsmen using the forests and waters.

The result has been an excellent forest fire record and very little damage to timber and other property, and in many cases, a spread of taxation within the towns where the burden would otherwise be concentrated on woodlands and timber.

RECREATION AS WELL AS RESOURCES are provided by protected forests. Shown is camp on Poe Valley Lake in Centre County, Pa. Trees are oak except for pitch pine in right foreground. (Photo courtesy American Forest Products Industries.)

GIFTS TO STATE—In 1939, the company gave the state of New Hampshire a parkway, 1000 ft. wide and 14 miles long, extending from First Connecticut Lake to the Canadian boundary. U. S. Route 3 now meanders through this parkway past Second Connecticut Lake, Moose Falls and Third Connecticut Lake to the Canadian boundary.

A picnic and camp ground has been constructed by the state at Moose Falls and picnic areas at Third Lake. More recently the State Conservation Department and the Guides Association constructed a dam on the Connecticut River near the Moose Falls camp ground, but outside the parkway, creating several trout fishing ponds.

A similar gift in Vermont enabled that state to construct a good road to Maidstone Lake, and set up a fine park with ample camping, picnicking, and swimming facilities. Each of these two gifts included enough timber and area to make them self-sustaining from timber sales, if the state so chooses, without affecting their recreational value.

In New Hampshire, the towns of Pittsburg and Clarksville have been the principal locations for recreational improvements. Some of the results of cooperation with the Conservation Department and Guides Association have been the construction of dams on ponds or bogs, built to improve brook trout fishing. Eight dams have been built on company lands to-date, in some cases replacing the ruins of dams built in early river driving days.

From shallow areas and bogs, these dams have created good ponds, which vary in size from 40 acres to more than 200 acres. Some have accessibility only by foot but most have gravel roads leading to them. Fringes of virgin or second-growth timber have been reserved along the shorelines for widths of 150 ft. or more. For example Round Pond, a fine natural body of water of about 100 acres, has been stablized by a new dam without changing its area.

CAMP SITES LEASED—The company leases several campsites on this pond for a nominal rental of $10.00 per year. These lessees plus the general public, who are in no way excluded from the pond, last year subscribed enough money and work to gravel an old logging road to the pond. The timber adjacent to Round Pond was severely damaged by the 1950 hurricane, but, in salvage logging, care was taken not to cut standing trees within 150 ft. of the shore.

In the past 15 years truck roads have been pushed into many of the more remote corners of these lands. Over 135 miles of fair to excellent gravel roads, plus hundreds of miles of ungraveled "winter roads," are left open to the public which is free to use them in reaching hunting or fishing. However, camping is restricted, since with the road network the sportsmen can return each night to either a state campground or one of the many sporting camps or lodges in the area.

In many cases, however, as mentioned at Round Pond, campsites are leased. For the fee of $10 per year, permission is granted for a person or group of persons to erect or maintain a cabin on a specific site, but they do not actually lease any land.

There are several hundred of these cabins scattered through the woods, on ponds or brooks. In some cases, these are built from old logging camp buildings and maintained for a few weekends of fishing or hunting.

Along the shores of Maidstone Lake in Vermont, there are fine summer cottages with all the modern conveniences and lived in all summer. In most cases, this system has attracted responsible people who take a personal interest in the land as though it were their own.

FREE SOURCE OF INFORMATION—This provides a free source of information as to things happening over the entire holdings which our limited staff might not notice for a year or two.

For example, a cottage owner on a pond may report leaf miners on the birch near his camp; another might report that in a hike over a remote ridge he found a large patch of blowdown spruce; another might send along a note with his lease rent mentioning that someone has cut over our boundary line; another mentions that a road has been washed out here or a bridge there; or that beaver have flooded a softwood flat.

Many times fires resulting from lightning strikes or human carelessness have been discovered and put out by these sportsmen or guides, or just neighbors. The rentals collected are a small part of the benefits of permitting free access to these lands.

In the past few years, New Hampshire has stepped up a program of game research and management.

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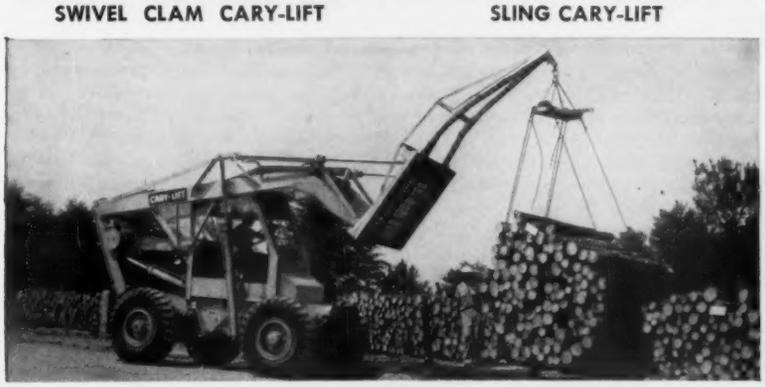

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Several "census trails" cross our lands. These are traveled several times each year to take a sample census of ruffed grouse, deer, and other game. The Fish and Game Department is provided with a campsite where several trails cross. Here shelter and supplies are available.

COOPERATION WITH STATE—In conjunction with the same work, the state is studying ways to retain existing winter yarding areas for deer and, if possible, to improve the browse within these areas. Each winter, the department biologists sketch on their maps the proposed logging areas for the following season. These are then checked to see if any sizable deer herd is wintering within the areas.

If winter yards are located, the biologists return and work with our foresters on a plan which will permit an economical cut on the area and yet retain the spruce-fit cover required to give the necessary shelter for the deer.

Often this calls for retaining an uncut fringe along a brook. It may leave a network of continuous or nearly continuous cover over a large hillside. Or, it may require leaving considerable mature timber.

In many cases, however, the timber left is well located near roads and can be harvested in 15-20 years when adjacent stands have closed in sufficiently to furnish the required shelter.

ADVANTAGES OF "FRINGES"—The uncut fringes along streams frequently retain the original shaded environment for trout, as well as reduce erosion problems on the stream banks. The deer yard areas vary in size from 60 acres to 350 acres and entail some planning in respect to wood harvesting.

In Clarkesville, N.H., a fringe was retained on the northerly side of the Middle Branch of Cedar stream for about 2½ miles in length and 150 to 200 ft. wide. This joins, at the lower end, a large deer yard area on state-owned land, and also connects with several patches of younger spruce-fit which will eventually increase the usable area of the yard.

This strip has effectively reduced snow depth, has stood up to winds for two years, and now furnishes a long fringe of browse on either side within easy reach by deer.

A similar stand of softwood growth on the Bog Branch of Cedar stream is being kept intact as a solid block of cover. This stand is young and thrifty, and although currently merchantable and accessible, will be left for 10 years or so, until the cutover on the Middle Branch of Cedar stream has closed in.

CUTTING TO AID DEER—A very heavily used deer yard on Labrador Brook (Clarksville) required special treatment. Here a stand containing 3,000 to 4,000 cords of balsam fir in an area of about 350 acres furnished winter cover to all the deer inhabiting approximately 10,000 acres the rest of the year.

This stand, partially cut 90 years ago, and the balance about 60 years later, was quite open, largely the result of the 1938 and 1950 hurricanes. Very good chance for browse existed between the rather limby fir, but there was enough continuous cover to retain paths of low snow depth almost everywhere.

Here the biologists paint-marked trees to cut (about 70%) with the intention of permitting an economical operation; increasing the number of small openings within the area; but still retain continuous strips of cover throughout the stand.

Because some marked trees were below the minimum diameter for cutting, only 1,700 cords were cut, leaving about 45% of the original volume. Hardwood sawlogs, yellow birch principally, within the area and in most of the surrounding country have been cut.

Sprout growth is expected in some cases, and this yard within a few years should support more deer than in its natural condition. It should be mentioned that the balance of the valley was cut to our own specifications, with about 14,000 cords of spruce and fir being removed without any serious effect on the deer herd.

POLICY FITS LOCAL CONDITIONS—Our policy, as evolved over the years, is designed to fit local conditions. Practically all land in this region has been in private ownership since the first settlements were made. Only recently, a few public areas have been set aside.

As roads were improved and more non-resident sportsmen reached the area, something had to be done for the landowners' own protection. Granting the park areas to the state removed pressure on the company to permit indiscriminate camping throughout the woods, which would have greatly increased the hazard of forest fires. Limiting these public areas has retained the incentive for local people to maintain sporting camps.

Keeping the roads open makes it possible for sportsmen to get in and out of remote areas, further removing the need for open camping at random. Leasing of campsites at modest rates has sprinkled the lands with cabins with suitable stoves, reducing further the chance of fire, and incidentally furnishing company personnel with shelter while cruising timber or doing other occasional work in any area.

"NEIGHBORS" STOP FIRE—There have been very few fires on these lands since they were acquired in 1926. A few years ago, one started from a choppers' tea fire in heavy slash. Several hundred men were working on it almost before word of the fire reached the company office. The fire spread to about 8 acres and then gave up. There just wasn't room for it to get past the feet of all our good neighbors. This "huge" fire is still talked about every time it gets dry.

Other features which have retained recreational values to the lands include leaving strips of uncut timber 150 ft. or more around both Big Averill and Little Averill Lakes in Vermont. The shores of these lakes were leased, for a nominal sum, to a large sporting camp.

This lease does not exclude the public, but keeps one entire side of Big Averill lake free of cottages and limits Little Averill lake to four existing cabins. The lessee maintains a fleet of row boats on Little Averill lake which are available for public use.

In Vermont, cooperation with the State Fish and Game Department permitted the closing of portions of various streams in the interest of spawning bed experiments and other fish propagation work.

Several lean-to shelters have been built by the Green Mountain Club on Stratton Pond. These lie on the "Long Trail" section of the "Appalachian Trail," which passes through our lands in this area.

Perhaps the latest type of multiple use has been the taking over of a mountain top in Vermont by the U. S. Government as a site for a radar station.

A recital of the program of most any pulp producing company will show a good record of multiple use activity. Our industry has accepted the responsibility of practicing full forest management on its lands.

This means that in the planning and administration of the timber growth and harvest, due consideration must be given to the respective associated water, game, fish, forage, and recreational potential of the properties. The present attitude can be best expressed by the word cooperation, which through the years has become brighter and brighter.

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of
FIELD and FOREST

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TOUGH . . . tireless . . . sure-footed . . . economical . . . easy to handle . . . easy to keep in good running order—that, in a nutshell, describes the John Deere Crawler Tractor, friend and favorite of loggers like Emilien Dodier, shown above bringing a big load of pulp out of the bush over "impossible" trails.

"Little Giant" and "pulling fool" are some of the pet terms the pulp men use to describe this simple, powerful, easy-to-understand tractor that's always ready to go.

Ask these men about their John Deere Crawlers and they will say what Mr. Dodier says: "For economy, flotation and stability, I do not think the John Deere Crawler can be beat."

Whatever your own needs, be sure to investigate the John Deere and its working equipment. The latest model brings you approximately 25 horsepower on the drawbar, with all the advantages of John Deere simplicity and quality, at a price that makes it easy to buy.

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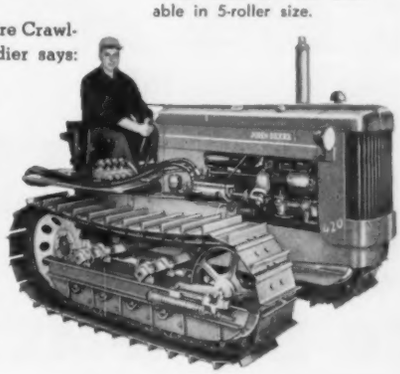
"In the past 5 weeks I have hauled 380 cords of pulp and 65,000 feet of logs through swampland to my truck road. The John Deere Crawler pulls the heavily loaded trailers (see pictures) with ease. Our average gas consumption is approximately 3 gallons per day. Your nickname, the Little Giant, is certainly appropriate and deserving."

. . . Emilien Dodier, St. Isidore d'Aukland, Quebec

Below: The John Deere 4-Roller Crawler. Also available in 5-roller size.



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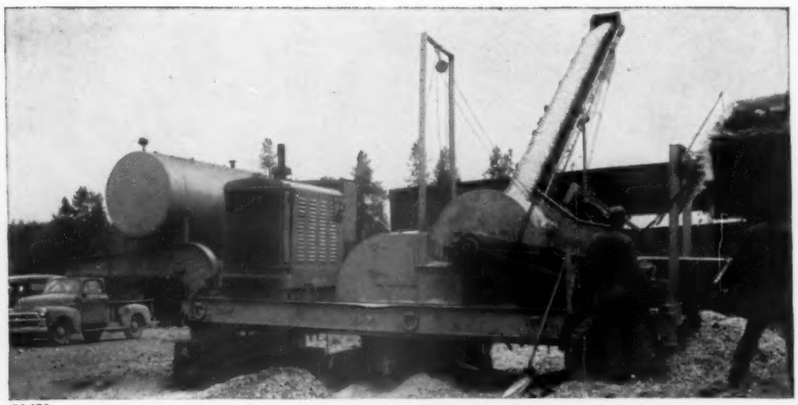

21401

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MINNESOTA

REVIEW OF ASSOCIATION ACTIVITIES

• Since its organization 22 years ago, the American Pulpwood Association has remained the only national organization representing both producers and consumers of pulpwood. Its program is set up and carried out to keep this industry posted on national legislation affecting its operations, production and procurement methods and equipment, labor training aids and programs, improved utilization methods, conservation and good forest management practices.

The representation and programs of the American Pulpwood Association were strengthened materially during the past year by many new members from Southern and Western regions. The new members from the South placed this organization in a position of having more than 90% of the pulpwood consuming capacity of that region.

The new members from the West include larger companies that account for close to two-thirds of the pulpwood and pulp log consumption in that region. Altogether this boosts the representation of the APA to a point that it now includes pulpwood consumers that have more than four-fifths of the pulp capacity of the United States.

To serve this expanded membership the following steps have been taken during the past year:

(1) The staff was strengthened by the addition of a Forester to assist the Executive Secretary with the Legislative and Forestry Programs of the Association. This brings the number of technically trained foresters on the staff up to five.

(2) Additional space in the main office in New York City was obtained to provide separate rooms for duplicating and other equipment, and for extra filing space.

(3) Plans for organizing a Western Technical Committee this year are under way.

(4) The Board of Directors was enlarged to provide the increasing membership with adequate representation.

Legislative Highlights—1955

The major legislative activity of the Association during 1955 centered around legislation proposing to amend the Fair Labor Standards Act by eliminating the current 12-man and seasonal exemptions. As a result of Association-spearheaded action and other factors, this expanded coverage originally proposed was defeated, and revision was limited to a 25 cent increase in the hourly minimum wage.

Other proposals in which the Association took an active interest covered such subjects as the common law "employe" definition under FLSA; timber sales from National Forests; the Forest Products Pricing Bill; the proposed changes in salary criteria for determination of executive employes under FLSA; increase in taxes on tires, tubes, and fuel; importation of Canadian labor for woods work; proposed extension of Federal Unemployment Insurance; State Ton-Mile Taxes; State Timber Severance Taxes; effect of rising Compensation Insurance cost; Federal Land acquisition proposals; Capital Gains Tax as it affects timber.

Technical Committees

The five regional Technical Committees, composed of individuals involved in pulpwood production and procurement for their respective companies, meet at least twice a year for a clinical discussion of operating procedures and equipment. Meetings may be devoted to consideration of a specific method, machine, or operation, or to a topic of general interest to the region concerned. Most meetings include, as part of the program, a technical review of wood preparation; hauling and handling equipment; training, safety, and supervision; and industrial forestry. A glance at the 1955 schedule below will give a good insight into the range of subjects covered by these Technical Committees.

NORTHEAST

January—Industrial Forestry; Safety and Training; Equipment

June—Hauling and Handling Equipment

October—International and Drott Equipment

LAKE STATES

May—Workmen's Compensation; Drott Equipment

September—Industrial Forestry; Logging Equipment

APPALACHIAN

May—Mill Wood Yard

October—Forest Management

SOUTHEAST

April—Meeting Southern Demand for Pulpwood

November—Slab Debarking

SOUTHWEST

March—Meeting Southern Demand for Pulpwood

October—Pulpwood Scaling and Quality

Equipment Handbook

To keep the membership further advised on the development, availability, and application of new equipment, the three APA Logging Engineers prepare releases for the APA Equipment Handbook. Supplemented in most cases by photographs, drawings, and observations of the equipment in actual operation, these releases serve to keep members posted on machines and methods designed to increase production, and at the same time, decrease unit cost.

Topics covered by Equipment Handbook releases include:

Power Saws
Sulkies and Arches
Loading & Hauling
Rigging
Peelers and Barkers
Slasher Mills
Tractors
Trucks
Trailers
Miscellaneous
Road Construction and Maintenance
Water Transportation
Camp and Repair
Tree Planting
Hand Tools
Railroad Transportation
Mill and Yard
Fire Protection
Forestry—General
Logging—General

Releases were issued during 1955 on the subjects listed on the next page.

Safety and Training

1955 saw the completion of three additional Training Guides and accompanying Workers' Notebooks. These publications are part of a series planned to provide background and reference material for training in various phases of pulpwood production. Released in 1955 were:

Guide No. 4. USE AND CARE OF POWER SAWS (English & French) outlines a program for training workers in safe and efficient methods of power saw use and care.

POWER SAW OPERATOR'S

NOTEBOOK (English & French), a pocket-size booklet, highlights the important points in Guide No. 4, designed to be distributed to each worker for his reference.

Guide No. 5. CHEMICAL DEBARKING OF TREES, outlines in non-technical language a program for training workers in the safe and effective procedures in chemical treatment of trees for bark removal.

CHEMICAL DEBARKERS' NOTEBOOK, a pocket-size booklet, highlights the important points in Guide No. 5, designed to be distributed to each worker for his reference.

Guide No. 6. ANIMAL SKIDDING, outlines a program for training either new men or men inexperienced in handling animals for pulpwood skidding.

ANIMAL SKIDDERS NOTEBOOK, a pocket-size booklet, highlights the important points in Guide No. 6, designed to be distributed to each worker for his reference.

The Safety and Training Officer's activities took him to every section of the country. Safety and training sessions were conducted for indoor groups, field sessions, and on-the-job crews made up of dealers, contractors, company men, and woodlot farmers. Some time was also spent conducting similar sessions for forestry colleges, and exhibits and safety talks were prepared and presented at forestry field days in the East.

Conservation and Forestry

Another important part of the APA program involves the publication of Forest Notes, containing forestry items of interest. During 1955, these Forest Notes highlighted:

Timber Resource Review
Timber Sales
Forest Fire Insurance
Tree Planting
National Forest Timber Harvest
Forest Service Appropriations

A major project of APA's Industrial Forestry program was cooperation in the release of Dr. Zivnsuka's analysis of the U. S. Forest Service Timber Resource Review. This report "Timber Today and Tomorrow" was prepared at the direction of the Forest Industries Council, of which APA is a member.

EQUIPMENT HANDBOOK RELEASES ISSUED DURING 1955

Release No.	*Subject*
218	Hiabob Pulpwood Loader
219	Consumption & Products from Pulp Processes
220	The "Taylor Pulpwood Dream'
221	Safety Woodland Boot
222	Photo. Volume Determinations of Wood Piles
223	Review: "Pulpwood Landings'
224	Sandvik No. 21 "Hard Point" Bow Saw Blade
225	Con-Sol Well Driller
226	Burnt River Mechanical Debarker
227	PMC Bolt-Length Gauge
228	Armstrong Tree Girdler
229	Safe-Line Wire Rope Clamp
230	Homelite Clearing Attachment
231	Pulpwood Grapple on Lift Truck
232	Cord-Cubic Volume, Slabwood & Edgings
233	Dray Skidding with Tractor: Michigan
234	Dray Skidding with Tractor: Michigan
235	Debarking Machines and Methods
236	Steel Pulpwood Frames for Trucks
237	Reducing Chain Saw Noise: Progress Report
238	Chip Concentration Yard with Slab Debarker
239	Tirfor Griphoist
240	Falcon Automatic Fire Detector
241	Pulp Chips from Veneer Waste: Progress Rpt.
242	Inner Liners for Tractor Tires
243	J. T. "Go-Getter" Tractor: Progress Rpt. 2
244	Pulp Chips from Sawmill Leftovers
245	Unloading Chips at Mill: Progress Report
246	Ditch Plow
247	BDU Chip Measurement: Longview Fibre Co.
248	Combination Skidder-Loader
249	Logging Arch on 3-point Hitch Tractor
250	Review: Minimum Requirements for Sanitation
251	Wagner Loggermobile

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UTAH — The Long Company, Inc. – Salt Lake City

VERMONT — State Equipment Company – Montpelier

VIRGINIA — Phillips Machinery & Tractor Co. – Arlington; Hampton Roads Tractor & Equip't. Co. – Norfolk; Rish Equip't. Co. – Richmond, Roanoke

WASHINGTON — Modern Machy. Co., Inc. – Spokane; Howard-Cooper Corp. – Seattle

WEST VIRGINIA — Rish Equip't. Co. – Bluefield, Charleston, Clarksburg, Parkersburg

WISCONSIN — Bark River Culvert & Equip't. Co. – Milwaukee, Green Bay, Madison, Eau Claire

WYOMING — Ke-emi Tractor & Equip't. Co. – Cheyenne, Casper

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ORGANIZATION AND PROGRAM FOR 1956-57

• The American Pulpwood Association will continue to strive for improvement in pulpwood preparation, loading, and production in general during the coming year. Its long-term objectives are:

(1) To conduct the Association in such a manner that it will guide and help the pulpwood industry to obtain pulpwood at the lowest cost, the highest quality and in adequate amounts now, and for future generations.

(2) To serve the entire pulpwood industry in our national programs of legislation, mechanization, training and safety and the intensive management of company forest lands.

(3) To encourage all members to prepare now for the predicted increase in consumption of pulpwood likely to occur during the next 10 to 20 years.

Board of Directors

The work of the Association is carried out by the Staff along the lines and policies laid down by the Directors of the Association. These men were elected by the Industry Members of the Association at their Annual Meeting on February 21, 1956, in New York City.

NORTHEASTERN REGION

E. C. Melcher
S. D. Warren Co.
Cumberland Mills, Me.

F. E. Pearson, Jr.
Eastern Pulp Wood Co.
Calais, Me.

C. S. Herr
Brown Company
Berlin, N. H.

William Hilton
Great Northern Paper Co.
Bangor, Me.

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Johnsonburg, Pa.

D. E. Hess
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Gettysburg, Pa.

G. L. Snowden
The Mead Corp.
Chillicothe, Ohio

W. J. Bailey
West Va. Pulp and Paper Co.
New York, N. Y.

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Neenah, Wis.

H. R. Palmquist
Marathon Corp.
Rothschild, Wis.

G. B. Amidon
Minn. & Ontario Paper Co.
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E. B. Hurst
Consolidated Water Power & Paper Co.
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Riegel Paper Corp.
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Savannah, Ga.

S. K. Hudson
Container Corp. of America
Fernandina Beach, Fla.

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Scott Paper Co.
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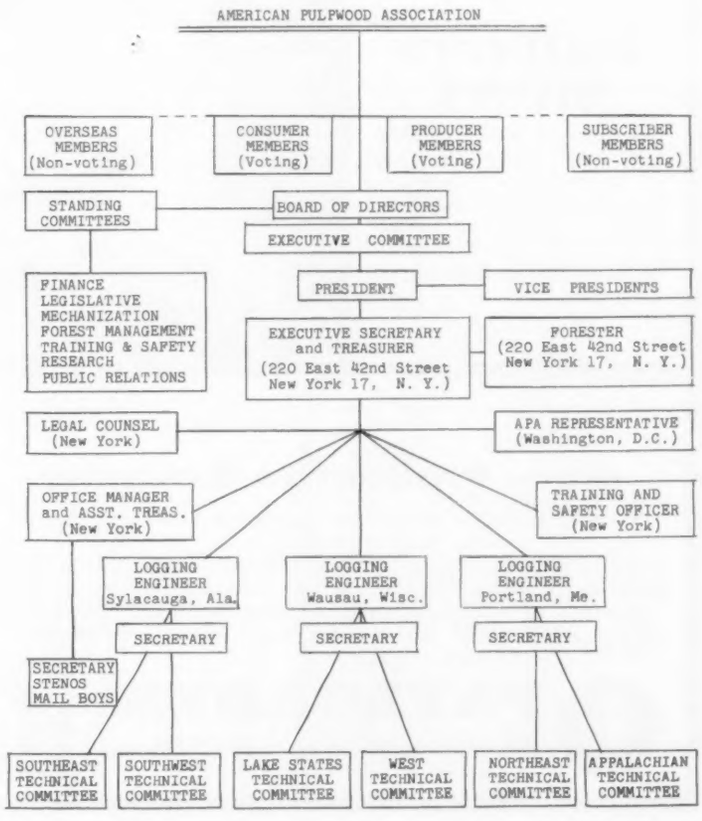

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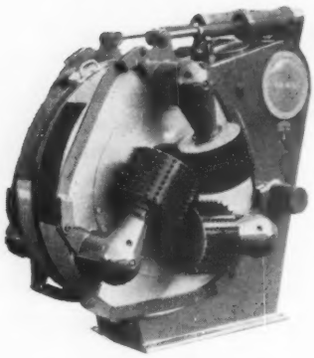

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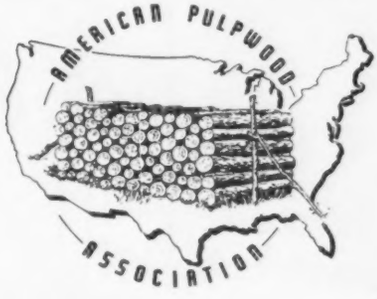

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Program for 1956

In addition to its regular activities, this year's plans include:

(1) Action on any proposed amendments to the Fair Labor Standards Act which would affect pulpwood operations.

(2) Issuance of training guides and workers' notebooks on truck and tractor operation.

(3) Preparation and release of "Pulpwood Industry Facts—1956" in cooperation with American Forest Products Industries, Inc.

(4) Enlargement of the Association slide, print and movie library to bring it more up to date and useful to the membership.

(5) Issuance of a Directory of Research in the Growing and Harvesting of Pulpwood, as a result of the research fellowship established at the State University of New York.

(6) Expansion of the activities of the Logging Engineers to include conducting safety and training sessions during the seven-month period when the Safety and Training Officer is not available.

These plans and others hinge on the needs and wishes of the members of the Association and of the industry as a whole. The staff is well organized to carry out the jobs assigned to it by the membership through the Board of Directors. APA can be effective in serving the industry only to the extent that members first make known their wishes, and then participate in the formation of policies and in carrying them out actively.

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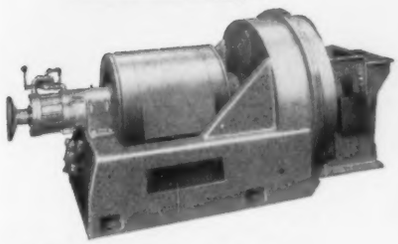

No. 510 Single Revolving Disc Refiner.
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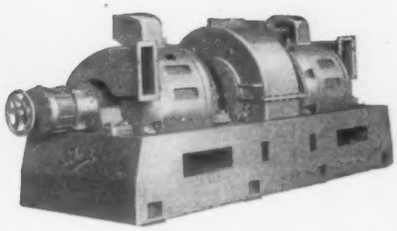

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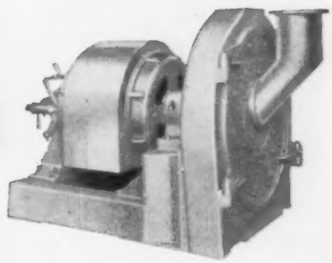

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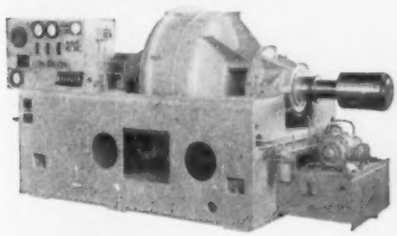

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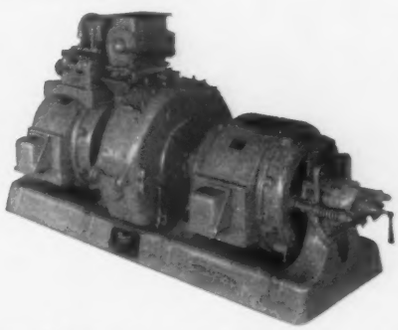

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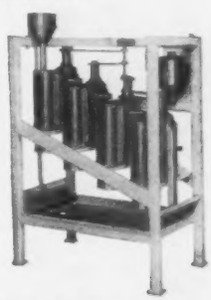

Bauer-McNett Fibre Classifier.
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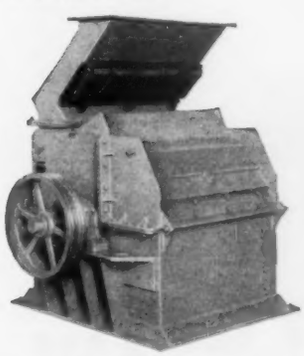

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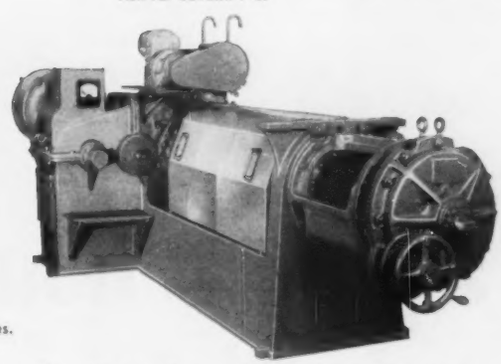

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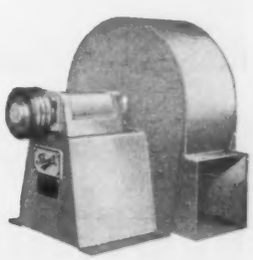

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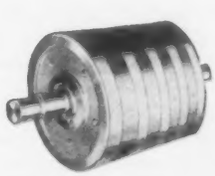

Permanent Magnetic Separators—Plate, Grate, and Pulley Types.
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Laboratory Refiner.
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Rapid Cycle Digesters.
Ask for details.

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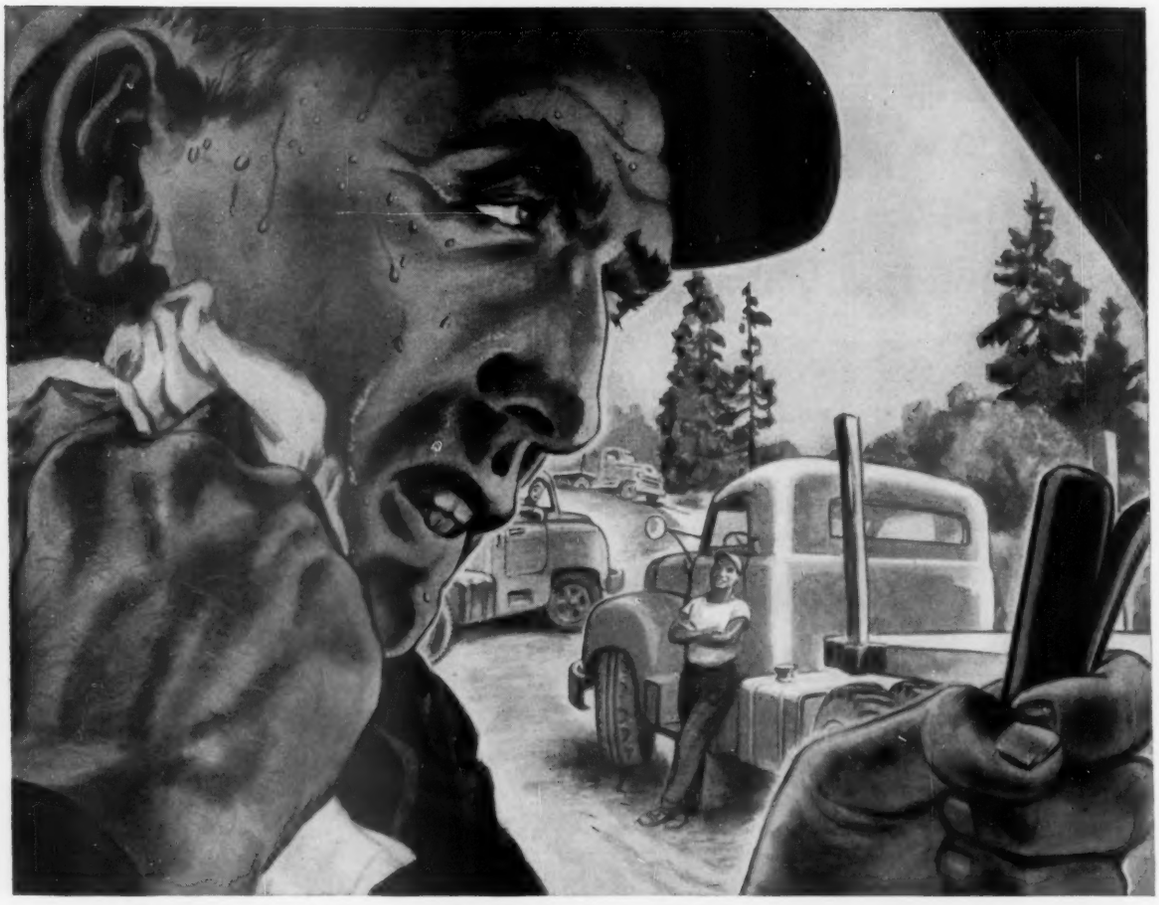

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PULPWOOD SECTION

HARRY S. MOSEBROOK, new Forester for the American Pulpwood Assn.

Harry S. Mosebrook Joins APA as Forester

Harry S. Mosebrook has been named to a new position as forester with the American Pulpwood Association. In making this announcement, W. S. Bromley, executive secretary, points out that Mr. Mosebrook's headquarters will be at the New York office, 220 East 42nd St.

Mr. Mosebrook comes to APA from the Chamber of Commerce of the U.S., Washington, D.C., where he was responsible for the forest industries section of the Natural Resources Dept. since 1952. Previously, he was forester for Monongahela Power Co. in West Virginia, and was on New York State College of Forestry faculty, as assistant professor of forestry. He received his b.s. degree in forestry from the University of Minnesota, and his m.f. from the University of Michigan. He served in World War II in the corps of engineers, and in the Korean War as captain in artillery intelligence.

As forester for the Association, Mr. Mosebrook will assume primary responsibilities for conducting its forestry legislative and industrial forestry programs.

Tree Planting by Industry Is Heavy in South and North

The nation's forest industries, sponsors of the American Tree Farm System, planted trees for tomorrow's timber crops on 239,028 acres of their own lands during the past year, according to official planting figures.

Total planting in the country reached an all-time high of 812,588 acres, 84% of which was privately-owned lands, says James C. McClellan, chief forester for American Forest Products Industries.

Not only did pulp and paper and other forest industries plant generously on their own lands, but they furnished seedlings and technical assistance for thousands of small woodlot owners around the country, said Mr. McClellan.

GEORGIA LEADS . . . Georgia, which leads the country in certified Tree Farm acreage, also led in tree planting with 96,384 acres, about half of which was on industry-owned lands. Florida planted 91,112 acres, 56,453 acres of which were industry-owned. Other planting figures include Pennsylvania, 58,530 acres; Mississippi, 51,866 acres; Louisiana, 45,244 acres; Michigan, 37,180 acres; Alabama, 36,729 acres.

While the bulk of seedlings came from state-owned nurseries, 15 industry nurseries produced 46,516,000 seedlings, the report showed.

"As more landowners recognize timber as a crop, more idle acres are being put to work growing trees," said Mr. McClellan. "Not only do Tree Farms provide the wood we need, but they protect watershed, provide food and cover for wildlife and increase recreational areas."

Eight-Year Experiment Ends; Longleaf Pine Seeded By Air

Alexandria Forest Research Center in Louisiana announces that a seeding experiment eight years in the making had come to successful conclusion. Since 1948, a handful of scientists sought to determine whether longleaf pine could be direct-seeded. Their work has been climaxed by successful direct seeding of 8,000 burned out acres in southwest Louisiana. Adding drama to the announcement was the fact that most longleaf seeding was done by airplane.

Crosby Chemical Co., with Hillyer Deutsch Edwards Lumber Co., Nebo Oil Co. and Kisatchie National Forest, were first to direct seed longleaf pine. They picked a barren area in southwest Louisiana in the center of a million acres that had long been nonproductive.

Flyer Bill Rose of Louisiana Flyers at Lake Charles worked with men from these companies throughout the summer, redesigning the seeding mechanism in his plane so it would accurately seed 3 lbs. per acre.

Painstaking studies were made to determine when to sow the seed, how much to broadcast per acre, type of seed to use, how to protect it against drought and pests. It took two years to find out how to keep birds from devouring seed as fast as it was sown.

The answer: A gray chemical called Morkit which is made in Germany and dusted over seeds before broadcasting.

One man, in a Piper Cub, can seed 1,000 acres of cut-over land per day at a cost of $4 to $5 per acre. Planting this area in seedlings would have taken 1,000 man-days at $15 an acre.

How States Now Rank In Tree Farm Acreage

The development of "working Tree Farms" is a movement which has been spearheaded by pulp and paper companies. By far, most Tree Farm acreage in the U.S.A. is "working" on a sustained yield basis for pulp and paper industries.

In total acreage certified as Tree Farms, Georgia leads all other states with 3,736,000 acres.

Florida is second; Oregon third; Texas fourth, then come Alabama, Arkansas and Washington—closely bunched—each with more than 3,300,000 acres.

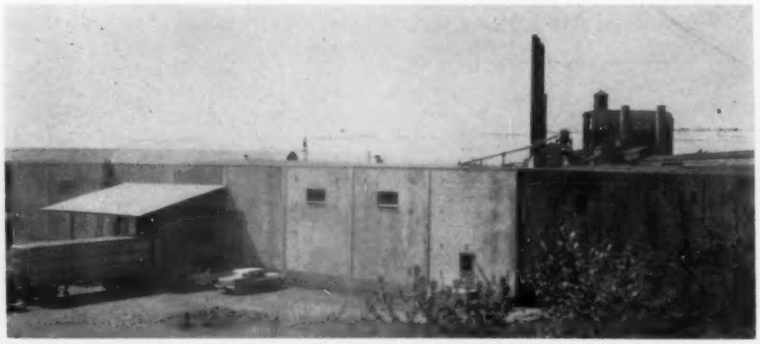
There is a substantial dropoff to the next three—California, Louisiana and Mississippi—each with around 1,800,000 acres.

Here are state figures, compiled by American Forest Products Industries, Inc.:

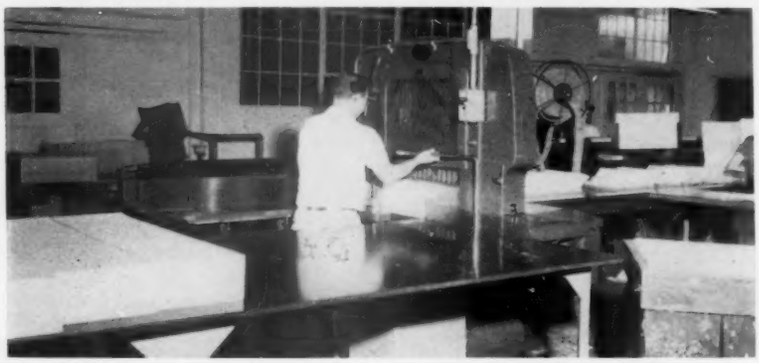
NUMBER OF TREE FARMS AND ACREAGE March 1956

State	Units	Acreage	State	Units	Acreage
Ala.	578	3,307,217	Nev.	1	12,984
Ariz.	3	875	N. H.	183	112,282
Ark.	437	3,302,568	N. J.	16	9,746
Calif.	199	1,856,265	N. M.	4	155,900
Colo.	6	78,132	N. C.	130	1,002,890
Fla.	192	3,555,451	N. D.	101	38,342
Ga.	274	3,735,941	Ohio	395	97,547
Idaho	417	888,496	Ore.	200	3,434,027
Ill.	26	5,738	Pa.	313	221,700
Iowa	6	449	R. I.	34	5,775
Ky.	34	20,234	S. C.	169	1,288,748
La.	163	1,816,621	S. D.	87	22,339
Me.	131	139,757	Tenn.	348	551,497
Md.	13	7,949	Tex.	787	3,370,354
Mass.	65	36,836	Utah	1	2,960
Mich.	422	818,625	Va.	169	691,189
Minn.	448	432,253	Wash.	264	3,300,743
Miss.	865	1,844,922	W. Va.	72	181,715
Mo.	50	140,937	Wisc.	71	824,263
Mont.	49	959,628	Wyo.	1	40,557

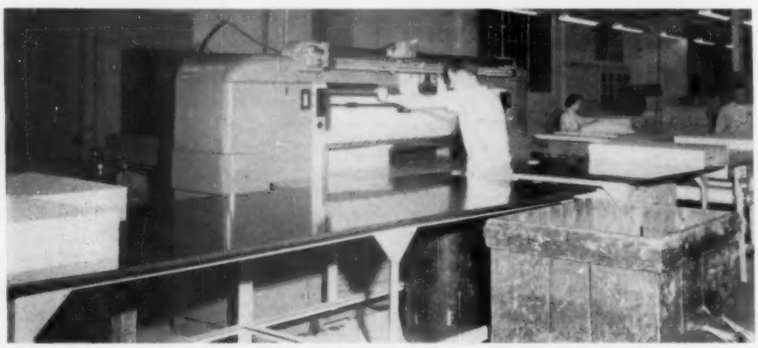
More Production Requires More Finishing at Columbia River



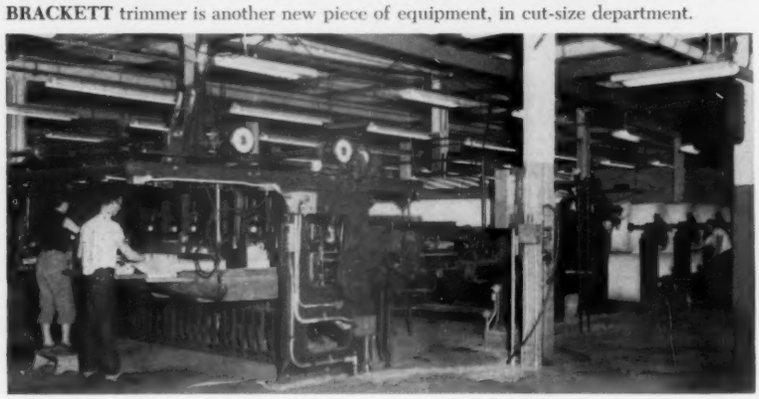
NEW 74,000 SQ. FT. PLANT ADDITION to Columbia River Paper Mills plant, Vancouver, Wash., is occupied by Finishing, Shipping and Warehousing Sections.



SEYBOLD 84-in. automatic spacing hydraulic trimmer is among new modern production machines in enlarged Finishing Section.



BRACKETT trimmer is another new piece of equipment, in cut-size department.



HAMBLET 128-in. duplex cutter-sheeter, with overlapping layboy and **Mamco** counter, cuts 10 sheets of 20-lb. duplicator paper at a time.

• Columbia River Paper Mills, producer of fine papers—and the only mill west of the Mississippi making vegetable parchment—increased production 15% last year at its Vancouver, Wash., mill. It now makes 120 tons a day (capacity) of sulfite pulp and equivalent tonnage of bond, writing, parchment, greaseproof, waxed and other specialties on three Fourdriniers (one 132 in. and two 136 in.).

To complement this, it has now completed and occupied a 74,000 sq. ft. addition, a one-story building housing enlarged finishing, shipping and warehousing facilities.

According to President Nils G. Teren and Production Manager Cecil Taylor, the addition not only meets present needs, but also will handle production increases scheduled for the future.

The company has completed about half of its current plant expansion-modernization program. No. 3 machine (See P&P Jan. '55, page 112) has been operating at increased capacity for over a year, rebuilding of No. 1 will be completed shortly and No. 2 is next in line for improvement. The plant's ammonia base sulfite pulp mill is also undergoing further modernization and expansion.

The finishing section, formerly in a 30,000 ft. area in the main machine room building, retains much of the original area plus a 20,000 sq. ft. section of the new structure. Additional production equipment has been installed in the new section along with machines which were relocated here. Five Seybold trimmers remain in production in the former operating area.

Prime production units in Columbia River Paper's recently established finishing section now consist of a 128-in. Hamblet duplex cutter-sheeter with overlap layboy, 84-in. Seybold hydraulic automatic trimmer and a Brackett trimmer for cut sizes—all new machines, plus three 336-in. duplex Hamblet cutter-sheeters, a Hayssen wrapping machine and allied converting equipment.

Finishing Supt. Jack Weiblen says this has resulted in marked production improvement. A steady, progressive flow can now be maintained from cutters to the assembly area, through trimmers to centralized packing area, and on to the warehousing and shipping sections.

He now finds it practical to accumulate stock at the trimmer and make runs of larger quantities, thus eliminating frequent trimmer set-ups. Tonnages previously processed in two-shift operations are now handled in a single shift.

HERE'S HOW TO *MECHANIZE* PULPWOOD HANDLING WITH LORAINS

40-TON LORAIN WITH SLING UNLOADS TRUCKS TO STOCKPILE

This crawler-mounted Lorain Crane unloads trucks to stockpile. Note the big load — and the high stacking that saves yard space.

Here's how to handle pulpwood fast, economically by modern Lorain methods. The 3 Lorains pictured here show just 3 ways Lorains save time and money. Incoming trucks are unloaded to stockpile with a Lorain Crane and sling. From stockpile, mill flumes are fed with another Lorain Crane and grapple. Rack cars get cleared in record time with another Lorain — the "Rake" — especially designed for rack car unloading.

The Lorain line makes it possible to handle pulpwood economically anywhere along the line — in the woods, at the collection yard, at the mill . . . and to handle pulpwood in any condition — jackstrawed, piled, racked or bundled . . . wet, dry or frozen. Slings, grabs, grapples, tongs and rakes can be adapted to any of these conditions. A wide assortment of crawler or rubber-tire mountings is available for any terrain or travel condition.

In addition to the standard Lorain line, Thew-Lorain has engineered special machines for pulpwood handling to fit specific needs, such as; crawler-mounted and gantry-mounted rakes, elevated cab designs for maximum visibility, and special gooseneck booms. Bring your pulpwood handling problems to your Thew-Lorain Distributor. He can tell you about standard or "special" Lorains so you, too, can mechanize your pulpwood handling the Lorain Crane way!

LORAIN-50 RAKE UNLOADS CARS . . . *This specialized pulpwood "unloader" reaches to the far side of the rack car to drop the "Rake" behind the stacked pulpwood. Then, with a pull toward the machine, it easily "rakes" the logs off the car into the mill flume. Cars are unloaded in minutes.*

LORAIN WITH PULPWOOD GRAB LOADS MILL FLUME . . . *Here, another Lorain works on a blockpile, handling jackstrawed pulpwood, with a grab. It loads the mill flume, keeping up with production needs easily, economically.*

THE THEW SHOVEL CO., LORAIN, OHIO

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How can we stop corrosion?

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"We Stopped Corrosion at our Plant!"

"Corrosion was *rampant* inside and out before Truscon diagnosed our troubles and prescribed TRUSCON CHEMFAST, corrosion and chemical resistant coating with Devran (epoxy resin)."

● If you have *any* corrosion at your plant, stop it *now* before replacement costs eat gaping holes in your profits! Send coupon above—take advantage of Truscon experience and know-how.

Chemfast is a heavy-duty coating for protecting indoor and outdoor surfaces of wood, metal and masonry against moisture, acids and alkalis. It owes its toughness to Devran (epoxy resin).

IT'S ALIVE—IT'S DEVRAN!

TRUSCON *Laboratories*
Division of Devoe & Raynolds Co., Inc.

GOOD YEAR . . . "Another good year for the industry is indicated by first quarter production of 8,045,000 tons of paper and board, the highest on record."—**E. W. "TED" TINKER,** executive secretary, American Paper & Pulp Assn.

NO DOUBT ABOUT IT . . . "Production and sales are continuing to maintain record levels in the second quarter. There is every reason to believe that overall activity both for our company and for the industry generally, will be above levels of last year."—**JOHN H. HINMAN,** chairman of board, International Paper Co.

THE AMERICAN CONSUMER . . . "Another plus factor on the economic horizon of the container industry is that incomparable characteristic of the American consumer—an everpresent willingness to buy something new, something better, something different. Packaging is playing an increasingly important role." — **NORMAN H. STONE,** chairman of board and president, Stone Container Corp.

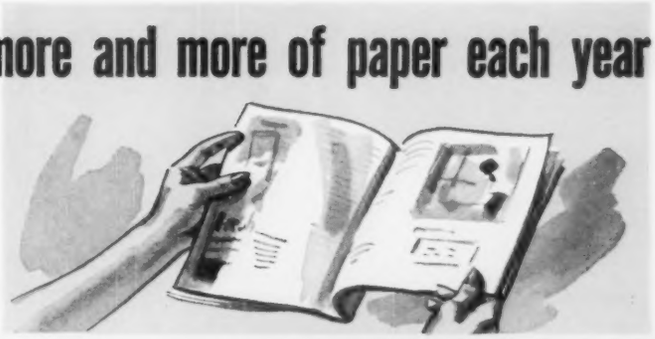
A NEW PACKAGE PRODUCT . . . "New uses for fine papers are fast appearing. One of the most interesting in package production is lamination of preprinted paper to paperboard. Finest quality papers, on which there are no printing problems, are combined with most inexpensive paperboard at considerably less cost than using high-quality coated boards required for fine screen printing."—**JOSEPH H. TORRAS,** asst. gen. sales mgr., printing, publication and converting paper division, St. Regis Paper Co.

"There has never been a period in our economic development when investment has offered greater opportunity to the investor than the period through which we are now moving. Billions of dollars of new capital are absolutely essential to the continued economic growth and health of the country. The sheer scope of future American capital requirements graphically underlines one fundamental point: public ownership of American corporations by shareowners will have to be greatly extended"—**J. D. ZELLERBACH,** president of Crown Z Corp.

Your customers demand more and more of paper each year

IMPROVED GLOSS, WITH BETTER LIQUID RESISTANCE

A Nopco Coating Additive gives this magazine paper better pliability, smoother finish, and improved printability.



GREATER STRENGTH, WITH HIGHER ALKALI RESISTANCE

A Nopco Surface Size gives meat wrap improved finish, scuff resistance, non-slip properties, blood resistance.

IMPROVED BENDING AT LOW TEMPERATURES, PLUS INK RECEPTIVITY

A Nopco Internal Size gives frozen food board greater moisture vapor resistance, greater gloss, improved liquid resistance.

NOPCO WAX SIZES AND COATINGS CAN HELP YOU MEET THESE DEMANDS

No question about it—your paper or paper board has to *do* more these days. If it fails, your customers may look somewhere else.

Nopco's paper technicians have more than kept abreast of these increasing demands... have anticipated your needs with a complete line of coating additives and with both wax and rosin-wax sizes for internal and for surface use. A careful choice of these advanced paper chemicals can keep your products ready to meet demands you might have thought unreasonable only a few years ago.

In short, Nopco offers sizes and coatings that will equip every paper and board you make with the properties you need to keep your customers more than happy.

And with any or all of these goes the skilled counsel and wide experience of Nopco's paper technicians. They will welcome the opportunity to work with you on the toughest problems you have. Write today for their recommendations. Nopco Chemical Company, Harrison, N. J.

NOPCO

PLANTS: Harrison, N. J.
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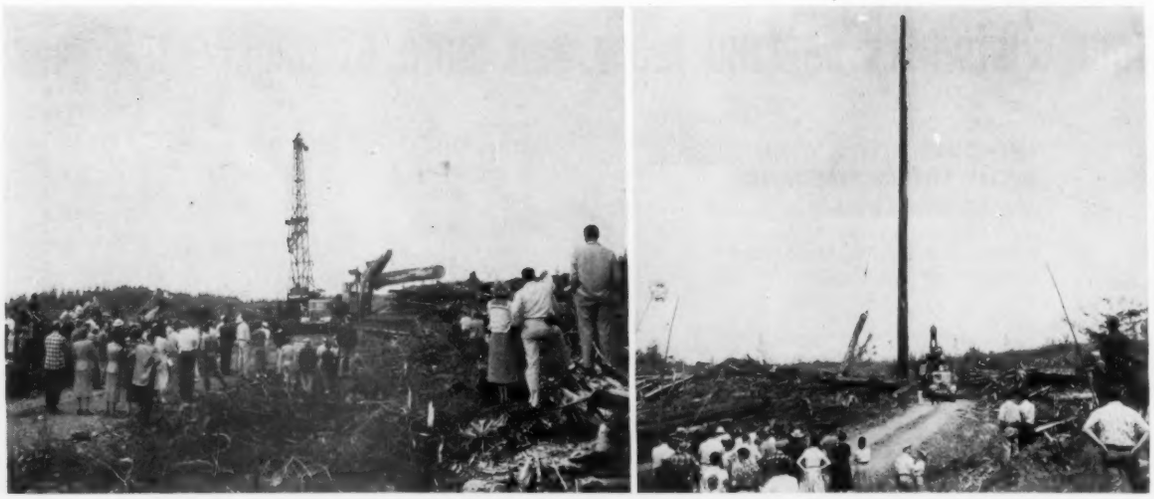


PULP & PAPER MAKERS SEE HOW MODERN LOGGING IS DONE . . . Woods tour of CZ's Clatsop Tree Farm provides intimate views. (Left), Washington Trakloader loading logs onto truck-trailer at landing as highlead system with portable steel tower brings them in. (Right), Spar tree highlead yarding to Washington loader equipped with Berger-Rees air tongs.

Gearhart Draws New Record Crowd

Learn facts about logging—also about measuring corrosion, saving steam, and reducing dirt and foam

● About all the various kinds of records established by previous Pacific Coast TAPPI-Superintendents joint spring meetings at Gearhart, Ore., were toppled by the May 17-19 session. One historic record that apparently yet stands is the "high gross" golf score Don Felthous, Weyerhaeuser Pulp, Longview plant engineer, shot a few years ago.

This year's attendance of 497 registrants topped all former joint Gearhart meetings—even the 1948 conclave which, until now, held distinction as "the biggest regional meeting ever held in Pacific Coast history," with an attendance of 360.

The only larger meetings held by this industry on the West Coast were the national TAPPI in 1949 at Portland, Ore., with 725, National Superintendents at Portland in 1951 with 888 (an all-time record for the Supts. Assn.) and last year's tri-way spring session, with 596 registering, at Victoria, B.C. This latter meeting included an additional sponsoring organization—The Canadian Western Branch, Technical Section—in addition to the Pacific Supts. division Pacific Section of TAPPI.

This year's meeting, held 10 years after the first joint session at Gearhart, was officially attended by 297 men and 200 women.

LEARN ABOUT WESTERN LOGGING . . . Of the 150 persons who took the the one-day woods tour of Crown Zellerbach's 185,000-acre Clatsop Tree Farm, relatively few had previously seen the ramifications of Western woods management in such realistic detail. That main logging roads cost an average of $12,000 per mile surprised some and the places where these roads took them surprised even more.

The 185-mile tour included visiting reforested areas which had been logged previous years; fire equipment in action; tree felling, buckling and topping; highlead logging with the use of spar trees and portable steel towers; loading logs onto trucks; weighing, banding and dumping the logs at tidewater preparatory to rafting them for river transport to the mills.

A full day of technical sessions started with the traditional "Wake-em Up" Breakfast featuring a stage extravaganza presented by the International Brotherhood of Migratory Peddlers, Waiting Room No. 1 (of Portland). As a climax of this play, E. O. Ericsson, of Puget Sound Pulp & Timber Co., was welcomed into IBMP, as an honorary member, by Jack Wilcox, of Electric Steel Foundry Co., who is president of the Peddlers.

The Superintendents' portion of the Gearhart program, held in four concurrent sections, featured a wide variety of topics.

DISPOSAL OF TURPENTINE . . . In the KRAFT SESSION, chairmanned by Hugh Wickett, Weyerhaeuser Longview supt., Allen Coleman, also of Weyerhaeuser Pulp, discussed the collection and disposal of turpentine, as carried on by the company in controlling odorous gases of the kraft mills. (See PULP & PAPER, pg. 105, March, 1955, for operating story.) Prevention of bleach plant scale in calcium hypochlorite stages was covered by John Miller, Harmac Pulp Div., MacMillan & Bloedel; heat balance in integrated pulp mills, by Graham Davis, Weyerhaeuser Pulp

Gearhart Most Popular

The broad sandy Pacific beach at Gearhart, Ore., has proved most popular site for the joint TAPPI-Supts. Spring Meetings on the West Coast. Sunshine a-plenty made it a big success this year. Attendance at six Gearhart meetings in 11 years:

1946.....350	1953.....409
1947.....315	1954.....426
1948.....460	1956.....497

Div.; recovery furnace fuel-air instrumentation by Russell Graff and James Gould, Longview Fibre Co. (See PULP & PAPER, pg. 146, May, 1956, for their technical presentation on this subject.)

SULFITE PULPING, chairmanned by Ducie C. Chads, of Puget Sound Pulp & Timber Co., covered diverse specialty applications of which some are still in experimental, unproven stages.

BETTER THAN MILL TESTS . . . D. L. Stewart, Powell River Co., Ltd., described pilot scale pulping equipment of the company's laboratory. This includes two 1.6 cu. ft. digesters, each with individual circulatory systems, a blow tank common to both, and associated liquor making equipment for most any cooking process. It also includes groundwood facilities. Although results are not necessarily directly translatable to mill scale, Mr. Stewart says they "are frequently more reliable than could have been obtained by mill tests" because conditions can be selected and more accurately controlled.

"TRY-IT-YOURSELF" IDEAS . . . Norval Magnusson, of Puget Sound Pulp, working on the "try-it-yourself" theme, described (1) a novel method of diluting 50% caustic to various strengths for mill use; (2) a throttling valve which restricts flow by air inflation; and (3) a weightometer which determines weight of belt carried chips by measuring air pressure necessary to float a section of the conveyor.

J. L. McCarthy, University of Washington, discussed an experimental project for mixing oxygen with MgO spent liquor to facilitate combustion. Pressure up to 1430 psi would be required in the reactor and reaction time in the mixing chamber is not yet known.

The PAPERMAKING PANEL, headed by Superintendents' Second Vice Chairman Henry W. Dauterman, Longview Fibre, devoted attention to (1) use of Beta gauges for measuring basis weight on a paper machine, by A. L. Petitjean, Western Dynamics Co., and (2) use of a Rotareaed Deculator and Bauer Centri-cleaners on Longview Fibre's No. 6 machine, by Delos Wilma of that firm.

BETA GAUGE SAVES STEAM . . . Mr. Petitjean says operators, by taking direct Beta gauge readings of total wet-end weight, "can immediately arrive at optimum settings to extract the maximum amount of water mechanically. . . . In many cases thousands of tons of steam can be saved each month by a simple twist of the wrist."

Mr. Wilma reported that difficulties experienced from foam and foreign material in paper and between rolls and wire, prior to installing the Bauer cleaner equipped Deculator, have practically been eliminated since adding this unit.

A finishing-converting panel, headed by Chairman Cecil Knapp, Crown Z Camas finishing supt., included talks on maintenance and "gadgeteering" by C. W. Davis, CZ Camas, bag factory operations by M. V. Roley, Longview Fibre, trimmer set-up by Vern Moore of Simpson Paper at Everett, and converting in general by Wolf C. Gigler, CZ Canada.

The Pacific TAPPI program, at which Frank E. Caskey of Morden

HEAD MEN AT PACIFIC COAST SUPTS. MEETING. (Right) Co-Chairmen of Gearhart Convention were chairman of Pacific TAPPI, JOHN M. McEWAN, Technical Director, Weyerhaeuser Kraft Mill, Everett, and Chairman of Pacific Coast Supts., MAX A. BAILEY, Supt., Westminster Paper Co. Ltd., New Westminster, B.C. (Middle) Guest of Honor was TAPPI Vice Pres. WARD HARRISON, Vice Pres. and Gen. Mgr. of Production, Riegel Paper Corp., who came from New York. (Left) Pacific Coast Supts. Officer, First Vice Chairman JACK V. SAVAGE, Sulfite and Bleaching Supt., CZ Camas; Secy-Treas. R. BURKE MORDEN, Pres., Morden Machines Co., Portland.

THEY CONDUCTED MEETINGS; DID THE TALKING. Papermaking Panel (Left, l to r): Chairman HENRY W. DAUTERMAN, Longview Fibre Co., Longview; A. L. PETITJEAN, Western Dynamics Co., Seattle; DELOS WILMA, Longview Fibre Co. Finishing and Converting (Right, l to r): Chairman CECIL KNAPP, Crown Zellerbach, Camas; VERN MOORE, Simpson Paper Co., Everett; C. W. DAVIS, Crown Z. Camas; WOLF C. GIGLER, CZ Canada, Vancouver; M. V. ROLEY, Longview Fibre, Longview.

Sulfate Pulping Panel (Left, l to r): RUSSELL GRAFF, Longview Fibre Co., Longview; JOHN MILLER, MacMillan & Bloedel Ltd., Harmac Pulp Div.; GRAHAM DAVIS, Weyerhaeuser Pulp Div., Longview; ALLEN COLEMAN, Weyerhaeuser Pulp Div., Springfield; Chairman HUGH WICKETT, Weyerhaeuser Pulp Div., Longview. Sulfite Pulping Panel (Right, l to r): J. L. McCARTHY, University of Washington, Seattle; D. L. STEWART, Powell River Co. Ltd., Powell River, B. C.; NORVAL MAGNUSSON, Puget Sound Pulp & Timber Co., Bellingham; Chairman DUCIE C. CHADS, Puget Sound Pulp & Timber, Bellingham.

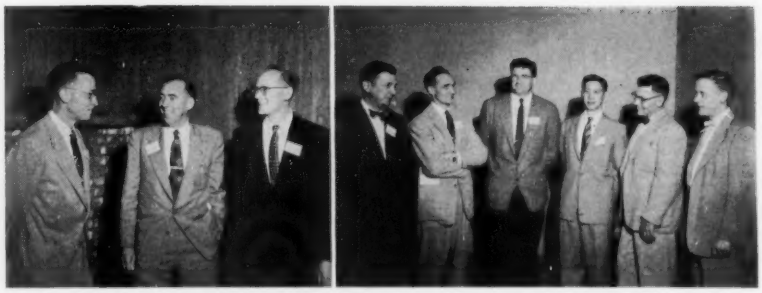
Machines Co. presided as moderator, featured four technical papers.

METHOD TO MEASURE CORROSION . . . Gilson H. Rohrback, of Crest Research Laboratories, Inc., told of a method for making direct electrical measurements of corrosion. By this means, he said, progress of corrosion on an exposed metal specimen can be followed without removing it from the system. Metal loss is detected by determining the increase in electrical resistance as cross-sectional area of the specimen is reduced.

SODIUM CHLORATE IMPROVES PULP . . . Joseph B. Heitman, Pennsylvania Salt Mfg. Co. of Washington, in discussing the effect of chlorate on chlorination stages of pulp bleaching, reported finding that addition of sodium chlorate imparts desirable properties to the bleach solution—improving yield, strength and brightness of pulp.

Christen Yang, of CZ Central Research Dept., presented statistical evaluations for selecting softness testers. D. Quackenbush and C. S. Walseth, of Weyerhaeuser Pulp Div. research department, disclosed a method developed for photo enlargement of slide-mounted fibers.

Top golf honors went to Glen D. King, CZ West Linn, Carl Fahlstrom, Longview Fibre, Harold Hilton, Hilton Products, Mrs. E. M. Johnson (husband with General Electric) and Mrs. Glen D. King.



PACIFIC TAPPI OFFICERS ELECTED. (Left, l to r) Chairman BEN T. BRIGGS, Research Mgr., Olympic Research Div., Rayonier, Inc., Shelton; Vice Chairman KENNETH BOOTH, Manager of Administrative Services, CZ Central Research Dept., Camas; Sect.-Treas. ROBERT H. SMYTHE, Ray Smythe Co., Portland.

TAPPI PROGRAM PANEL. (Right, l to r) Moderator FRANK E. CASKEY, Morden Machines Co., Portland; GILSON H. ROHRBACK, Crest Research Laboratories, Seattle; JOSEPH B. HEITMAN, Pennsylvania Salt Mfg. Co. of Washington, Tacoma; CHRISTEN H. C. YANG, CZ Central Research Dept., Camas; D. QUACKENBUSH and C. W. WALSETH, Pulp Div. Research, Weyerhaeuser Timber Co., Longview.

MIGRATORY PEDDLERS' SIMULATED TELECAST OF "WHAT'S MY RACKET?" ends by making E. O. ERICSSON (2nd from left), Puget Sound Pulp & Timber Co., an Honorary Member. IBMP Pres. JACK WILCOX (left), of ESCO, extends fraternal welcome. Members of cast (l to r behind table) WALTER A. SALMONSON, Walter A. Salmonson Co., JOHN L. AYRES, E. I. duPont de Nemours & Co., TOM SCARFONE, Eastwood Nealley Corp., R. J. GOODWILLIE, Beloit Iron Works. Floor Director T. H. JAMES JR., The Flox Co., at left with back to camera.

Norton Co. Opens Plant in California

The Norton Co. of Worcester, Mass., formally opened its brand new Santa Clara, Calif., west coast manufacturing plant in May. It is producing a complete line of grinding wheels, including diamond wheels. Plant is located at 2555 Lafayette St.

Western customers are offered much faster deliveries on abrasive products from this new plant, especially on non-standard items which formerly had to come all the way west from New England.

Key executives on hand for the opening, led by Pres. Milton P. Higgins, where Ralph F. Gow, exec. vice pres.; Ralph M. Johnson, vice pres., sales; John Jeppson, vice pres., mfg.; Donald L. Price, sales manager (all three in Abrasives Division); and Elliott B. Knowlton, public relations manager.

EXAMINING NEW MACHINE at Santa Clara plant is a trio of Norton executives. L to r: Exec. Vice Pres. RALPH F. GOW, Plant Mgr. GEORGE A. GARRISON and Pres. MILTON P. HIGGINS.

Scott Denies Charges

Scott Paper Co. has categorically denied Federal Trade Commission charges that it violated the Clayton Antitrust Act by its stock exchange mergers with the former Soundview Pulp Co., Hollingsworth & Whitney Co. and Detroit Sulphite Pulp & Paper Co. Scott will file an answer to the charges.

"A MODEL OF ITS KIND" is what Norton Pres. MILTON P. HIGGINS called this new abrasives plant, located at Santa Clara, Calif., for serving Western industry.

Your food products customers will welcome this new way to protect flavor and aroma—

IONOL®, C.P.

...impregnated paper and boxboard combats surface rancidification

Rancidification is the mortal enemy of flavor and aroma. When fats and oils migrate from food products to box or wrapper surfaces, they rancidify quickly. Results: deterioration of quality; reduced shelf life; consumer dissatisfaction.

Now there is an *effective new way* to solve this troublesome problem... one that will be welcomed by manufacturers of baked goods, cereals, meals, shortening, packaged meats, butter, and similar products. Ionol, C.P. antioxidant — incorporated into the boxboard or wrapping materials in which products are packed—provides long-lasting protection against rancidity by effectively preventing oxygen attack on fats.

In actual tests, baked goods were stored at 85° F in Ionol, C.P.-impregnated boxboard cartons, which were found to be free of rancidity at the end of ninety days. Without Ionol, C.P.-antioxidant protection, packages of baked goods stored under similar conditions often develop rancidity within a week.

Be among the first to offer your customers this new, effective packaged foods protection. Write for: "Ionol, C.P. for Impregnating Paper and Paperboard."

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PICTURES OF PEOPLE IN THE NEWS

Brainerd and Dickey Advance

FORREST W. BRAINERD (left) and CHARLES D. DICKEY, JR. (right) are new Assistant Vice Presidents of Scott Paper Co. Mr. Brainerd is currently Special Assistant to the Executive Vice President (Raymond C. Mateer), while Mr. Dickey is Administrative Assistant to the Vice President in charge of West Coast Operations (Paul Baldwin).

Mr. Brainerd has been with Scott since 1931, initially as a third hand in Chester, Pa., paper mill. He was named research chemist and, to implement his training, attended Institute of Paper Chemistry. He graduated from U. of Pennsylvania. He became Manager of Research and Development, Staff Technical Director (1942) and General Mgr. of Pulp Mills (1947). He was subsequently named Plant Manager, Director and Vice Pres. of the Falls Paper & Power Co., a Scott subsidiary at Oconto Falls, Wis. In 1954 he was appointed to his present post. Mr. Dickey, Yale graduate, joined Scott in 1946, as washroom advisory service consultant in Industrial Sales. He had served three years with U.S. Marine Corps, was discharged a First Lieut. He became a New York Salesman, Staff Purchasing Buyer at Chester, and was transferred in 1952 to Everett, Wash., as Purchasing Agent, later was named Procurement Director for the West Coast, gaining his present post last year.

Head Electrical Dept.

New Electrical Supt. of Powell River Co's pulp and newsprint mill at Powell River, B. C., is O. MELVIN JULSON (left), and his assistant will be RICHARD G. CHRISTIE (right). Both are graduates of U. of British Columbia. Mr. Julson, who was formerly with Canadian General Electric and taught at Calgary's provincial technical school before joining Powell River Co., succeeds the man he worked with for nearly nine years, EWART G. CRAIGEN, who recently retired. Mr. Christie was formerly with Canadian Ohio Brass at Niagara Falls, Ont.

Exec Changes at Fraser

AUBREY CRABTREE (left), President and General Manager since 1940, now succeeds the late HAROLD CRABTREE as Chairman of the Board of Fraser Cos. Ltd. H. ROY CRABTREE (middle) has been elected a Director to succeed the late Mr. Crabtree, and R. A. JODREY (right) has been elected to the board to succeed S. F. DUNCAN, of Toronto, who resigned. The new Directors also are members of the company's Executive Committee. Aubrey Crabtree has been with the company for 25 years. Roy Crabtree is Chairman and President of Woods Mfg. Co. and a Director of Howard Smith Paper Mills. Mr. Jodrey is President of Minas Basin Pulp & Paper Co.

Dave Moon is Now V.P.; Dave Sealey Retires from NPA

D. G. MOON (left), Consultant and Head of Pulp and Paper Dept. of J. E. Sirrine Co. and an engineer and builder of many pulp and paper mills, particularly in the South, is now a Vice President of the Sirrine engineering firm of Greenville, S C. He is a graduate of the City of London Technical Institute. In this country, he obtained early engineering experience in hydroelectric plants in Wisconsin, was a major in U. S. Army Engineers in WW I, was Chief Engineer for Continental Paper & Bag Corp. and was with International Paper Co. He moved South in 1936 to work on Union Bag construction and joined Sirrine in 1939.

DAVID A. SEALEY (right), has retired as Secretary of the Eastern Division, National Paperboard Assn. He was feted by industry members at a testimonial luncheon on June 14. He joined NPA in 1934.

Jim Clark Moves to Victoria; Jaro Holy Joins League Staff

JARO HOLY (left) has joined the staff of Sulphite Pulp Mfrs. Research League, Appleton, Wis., as Administrative Asst. for Product Development under Technical Director AVERILL WILEY. Mr. Holy was born in Prague, Czechoslovakia, attended Universities of Dijon (France) and Prague, earning master's in chemistry and biology. He came to America in 1938, when his father was Consul-General in Chicago, did graduate work at Northwestern and Kansas in economics, served in British Royal Air Force in war. Recently he was in charge of chemical work at Exide Battery Co. and has applied for U.S. citizenship. His job is to find markets for sulfite chemical by-products, uses as dispersing agents. DR. JAMES D'ARCY CLARK (right), has moved to 3385 Upper Terrace Road, Victoria, B.C. (P.O. Box 96), from Longview, Wash., to continue his work as Consultant to the industry. Dr. Clark, who was born in England, graduated from the University of London and the Institute of Paper Chemistry in Appleton, specializes in dry felting processes, board manufacture and stock preparation. He invented a so-called wafer board, now in production on the West Coast. He was Lt. Colonel in the U.S. Quartermasters' Corps, Chicago, World War II, in developing boxes for overseas shipping.

In New Positions

CHARLES E. HILL (left), former Asst. Chief Engr. of a paper machine building firm, has been appointed Chief Engr. of Patton Mfg. Co., Inc. He is an engineering graduate of Duke U., received his master's from U. of Delaware. He worked on new machines in Midwest, South and Far West, and worked closely with Brown Paper Mills (now Olin Mathieson) in first achievement of 2,000 fpm on kraft bag paper. WAYNE T. CRANNELL (right), former Acting Chief Engr. and Sales Mgr. of Patton's Paper Mill Div., will now devote full time as Sales Mgr. of the division. He has had 14 years experience in the pulp and paper field, attended Lehigh U. He worked with machine builders and was largely responsible for many engineering innovations on American Box Board machine at Filer City, Mich.

BRIEFS
for caustic soda buyers

Choosing a supplier
New booklet
New producing point

Some tips on supply logistics

Like all Hooker plants, this one in Montague, Michigan, is near deep water for a purpose—a purpose you might consider when choosing a supplier.

The water gives our customers the option of barge as well as rail delivery.

For many, the barge service means cheaper delivery. For others, it offers an alternative means of shipment in case of interruption in rail service.

Here are three other "pluses" to consider when you select a chlorine-caustic supplier. (As a Hooker customer, you enjoy all of them):

1. Competent engineering help. An experienced supplier can give you assistance in designing or revamping your chlorine or caustic soda handling system.

2. Operating assistance. Your supplier's technical servicemen can often spot—and help you correct—operating troubles before they become serious. Do you get the advantage of periodic technical service visits?

3. Safety programs. Your supplier should be able to give you up-to-date advice on safe equipment and handling methods.

We'll be glad to enlarge on these points, with your requirements in mind. Simply phone or write the nearest Hooker sales office.

New booklet, pocket size, offers useful facts on buying caustic soda.

Besides information on forms, grades, and shipping containers, contents include a factual discussion on 50% *vs.* 73% liquid caustic, and a handy nomograph to help you figure which strength is your better buy.

There's also a nomograph to help you estimate your requirements for various process solutions.

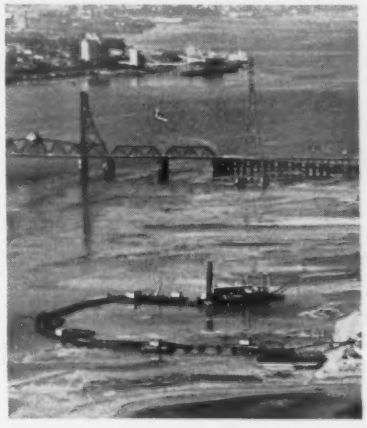
Check the coupon for a copy.

Progress report... The most ardent sidewalk superintendent would take delight in the building of our new chlorine-caustic soda plant at North Vancouver, B. C.

Huge dredges are moving 1,000,000 yards of sea bottom to build a 100-acre base for the plant, well above high tide.

When it's completed early in 1957, the plant will be Western Canada's first domestic source of caustic soda and chlorine. Owned and operated by Hooker Chemicals, Ltd., it will provide shorter supply lines by rail and barge, and small but real freight savings. It will eliminate the need to pay duty on caustic soda and chlorine.

If your company has a plant or plans to build one, in British Columbia, this is a good time to find out how Hooker Chemicals, Ltd., can serve you.



Check items you'd like to receive:

- ☐ *Caustic Soda Buyer's Guide* booklet
- ☐ Technical data on caustic soda

For information on these other Hooker chemicals used in the pulp and paper industry, check below:

- ☐ Muriatic Acid
- ☐ Sodium Sulfide
- ☐ Sodium Sulfhydrate

Clip and mail to us with your name, title, company address.

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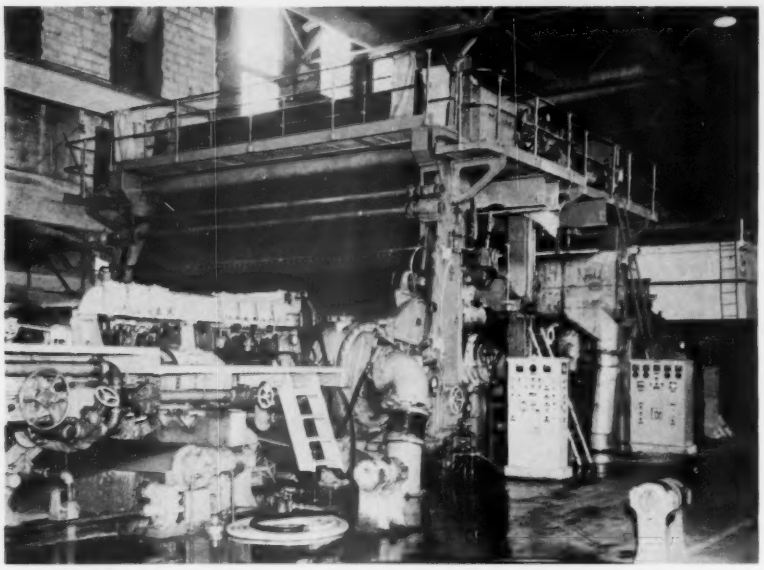


AFTER THE CONVERSION JOB IN 15 DAYS . . . The reliable Dominion Engineering Co. machine, all prettied up by modernization job, is ready for another long period of operation. The machine was originally built in 1930. Powell River Co. is now installing its ninth paper machine.

Major Conversion in 15 Days

● Powell River Co. engineers, technical personnel and service division crews teamed up to carry out the largest and most important machine conversion job ever attempted at the British Columbia paper town. The objective—to modernize the 228-in. No. 7 paper machine installed by Dominion Engineering Co. in 1930. It took just 15 days.

The project involved installation of a pressure type head box with variable speed fan and pump motors and cross-flow distributor of parabolic shape designed by Powell River Co.'s research department and adapted by Dominion; replacement of conventional open type screens with seven Shartle-type Selectifiers to screen out shives and dirt and to break up lumps in the stock; installation of a new Fourdrinier with the wire lengthened from 92 ft. 1 in. to 102 ft. 3 in., making it the longest at the mill.

A new saveall filter was also installed, a forward drive roll and new vacuum couch transfer similar to the one installed a couple of years ago on No. 8. Relocation of the first and second presses had to be undertaken, and a new General Electric drive replaced the existing Harland drive.

No. 7 machine was running at 1,550 fpm when it was shut down for the rebuild. Fifteen days later, in late April, it was started up at 1,610 fpm without giving any trouble, and it has been running steadily ever since, its speed increased slowly and methodically.

HOW ELECTRICAL WORK WAS DONE . . . Ingenious was the preshutdown installation of a new dryer drive motor and reduction gear. It happened to be located directly above one of the old dryer drives, so mechanics mounted it on a steel base and lined it up ready to run. A new transformer bank to supply the extra power needed for No. 7's speedup was "energized," ready and waiting for the final hookup. Cable trays for the new switchboard were installed above the old switchboard, which was still in operation. Also, the starter for the new General Electric synchronous motor which drives generators for the new paper machine drive.

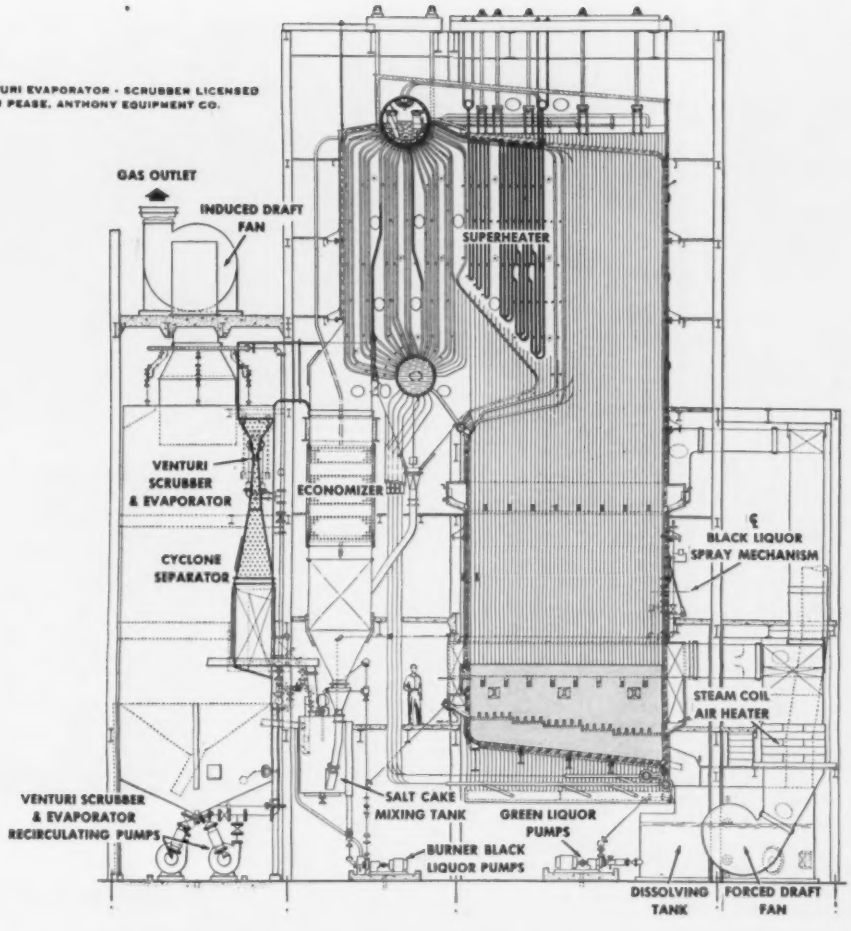
A new General Electric motor generator set was completely installed and all ready to replace the old set.

Eight cabinets housing the very complicated electrical relay systems involved in the Lamb-Grays Harbor roll handling equipment were put in place. General Electric amplidyne sets were installed behind the existing Harland switchboard, despite the fact that the board was alive and the machine still running. (The amplidyne sets, which might be described as power amplifiers, are an essential part of the precise speed control system for the General Electric drive.)

Three new dryer drive motors and reduction gears were installed beside the old drives which were still running. The new drives were lined up, grouted in, and ready to go. The whole program was carried out without a hitch. The machine is running in top form and, above all, a better overall formation of the sheet has been achieved by the speedup.

$1,250,000 On Pollution

Crown Zellerbach Corp. has invested approximately $1,250,000 in 15 years in plant installations and research studies designed to eliminate or reduce water and air pollution which may result from chemical pulping processes.



POTLATCH FORESTS, INC. Install a B&W Recovery Unit with Venturi Evaporator-Scrubber

This B&W black liquor recovery system was installed at Potlatch Forests, Inc., Lewiston, Idaho in November, 1955. It includes a B&W Venturi Evaporator-Scrubber, an unusual feature which combines in one piece of equipment both the concentration of black liquor and the collection of salt cake fume.

The complete dependability and unusually high efficiency of the unique Venturi feature have been fully proved in service in many installations, some with operating periods up to three years.

The B&W Unit at Potlatch has a capacity of 300 pulp tons per day and is designed for 141,400 lb of steam per hr, at 650 psi and a total steam temperature of 750 F. Additional B&W Recovery Units in varying capacities, and equipped with Venturi Evaporator-Scrubbers are now on order for other pulp and paper mills.

B&W can help you choose a recovery system that has the right combination of features for your mill conditions. The Babcock & Wilcox Company, Boiler Division, 161 East 42nd Street, New York 17, N. Y.

ADVANTAGES of the B&W Venturi Evaporator-Scrubber

Simple to operate
Low in First Cost
Increases Overall Thermal Efficiency
Reduces Maintenance Requirements
Continuous, High, Fume Collection Efficiency
Minimum Space Requirement
Reduces Multiple-Effect Evaporator Load

BABCOCK & WILCOX

BOILER DIVISION

P-796

Drainage Control Boosts Output

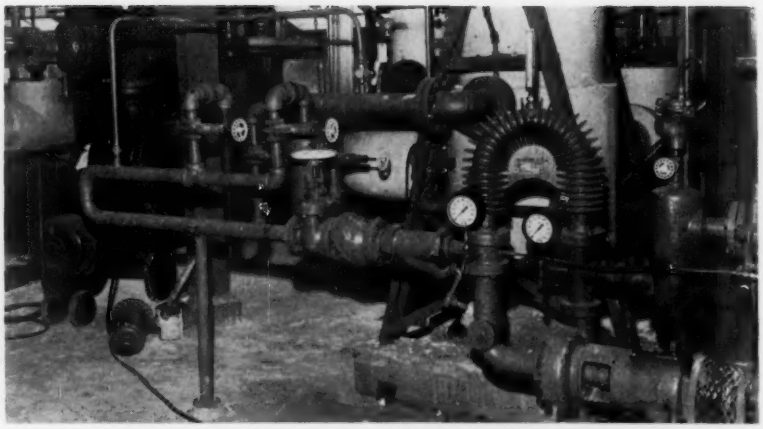
By R. BURGESS*

● With demand for paper today far exceeding supply, one way to increase output is to increase productive capacity of present machines. Most new machines are designed for higher speeds, equipped with larger diameter dryers and wider trim, and because of increased speed higher steam pressures can be used, thereby increasing output.

This raises serious competition for older machines; yet it is important these machines be maintained and operated at maximum to meet the demand. One way to increase their production is to improve the drainage system. In five years, this has been done on 150 machines by equipping them with the C-B Condensate Drainage Control unit.

Operators have found they can increase production rates as much as 20% with this system and, at the same time, hold steam costs to an absolute minimum. A half dozen nationally-known paper companies, among those which have installed this equipment, had such outstanding results, that additional units were ordered for other machines. One company has equipped four paper machines with C-B units and will add it on a fifth.

HOW PRODUCTION IS INCREASED . . . The solution to achieving maximum heat transfer lies almost completely in the proper control of the vent rate at the outlet of any condensing medium. The answer is a device that will continually control the flow of condensate and air from the condensing medium, without allowing escape of live steam and with a minimum of pressure drop through the control orifice.



C-B UNIT IN MEAD MILL. One of Mead Corp. installations of C-B Drainage Control unit, showing arrangement of unit (see diagram in Fig. 1, at right). From small cylinder at extreme right, pipeline extending off picture, to right, goes to boiler. Above this cylinder is air vent. Condensate return line from condensate header extends to left of unit.

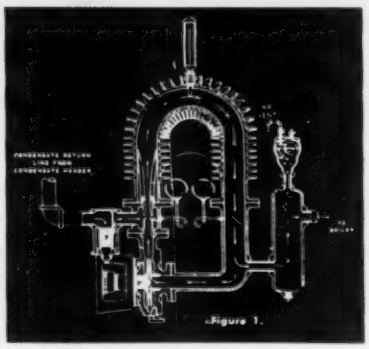


Figure 1.

The C-B unit provides these conditions at maximum. This unit drains the condensate header of a paper machine dryer. The condensate flows into the jet actuated by a centrifugal pump operating in a closed circuit. It utilizes condensate as the energizing force, and it is capable of establishing a pressure rise from inlet to discharge pressure as high as 200 psi, where required.

The jet handles a combination of gases, air and liquid (the undesirable elements in a condensing medium). Its action is continuous and smooth and flow is at the exact rate at which the dryers are condensing.

The only existing pressure drop across the dryer siphons is created by jet action. This drop is established by the difference in temperature between

* Cochrane Corp.

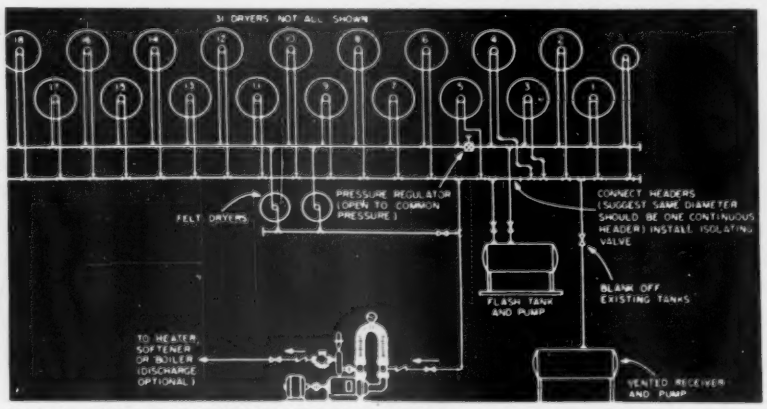

31 DRYERS NOT ALL SHOWN
PRESSURE REGULATOR (OPEN TO COMMON PRESSURE)
FELT DRYERS
CONNECT HEADERS (SUGGEST SAME DIAMETER SHOULD BE ONE CONTINUOUS HEADER) INSTALL ISOLATING VALVE
FLASH TANK AND PUMP
BLANK OFF EXISTING TANKS
TO HEATER, SOFTENER OR BOILER (DISCHARGE OPTIONAL)
VENTED RECEIVER AND PUMP

FIG. 2—HOW C-B DRAINAGE CONTROL UNIT IS SUPERIMPOSED ON FLASH SYSTEM. This permits operation of either system for comparative purposes.

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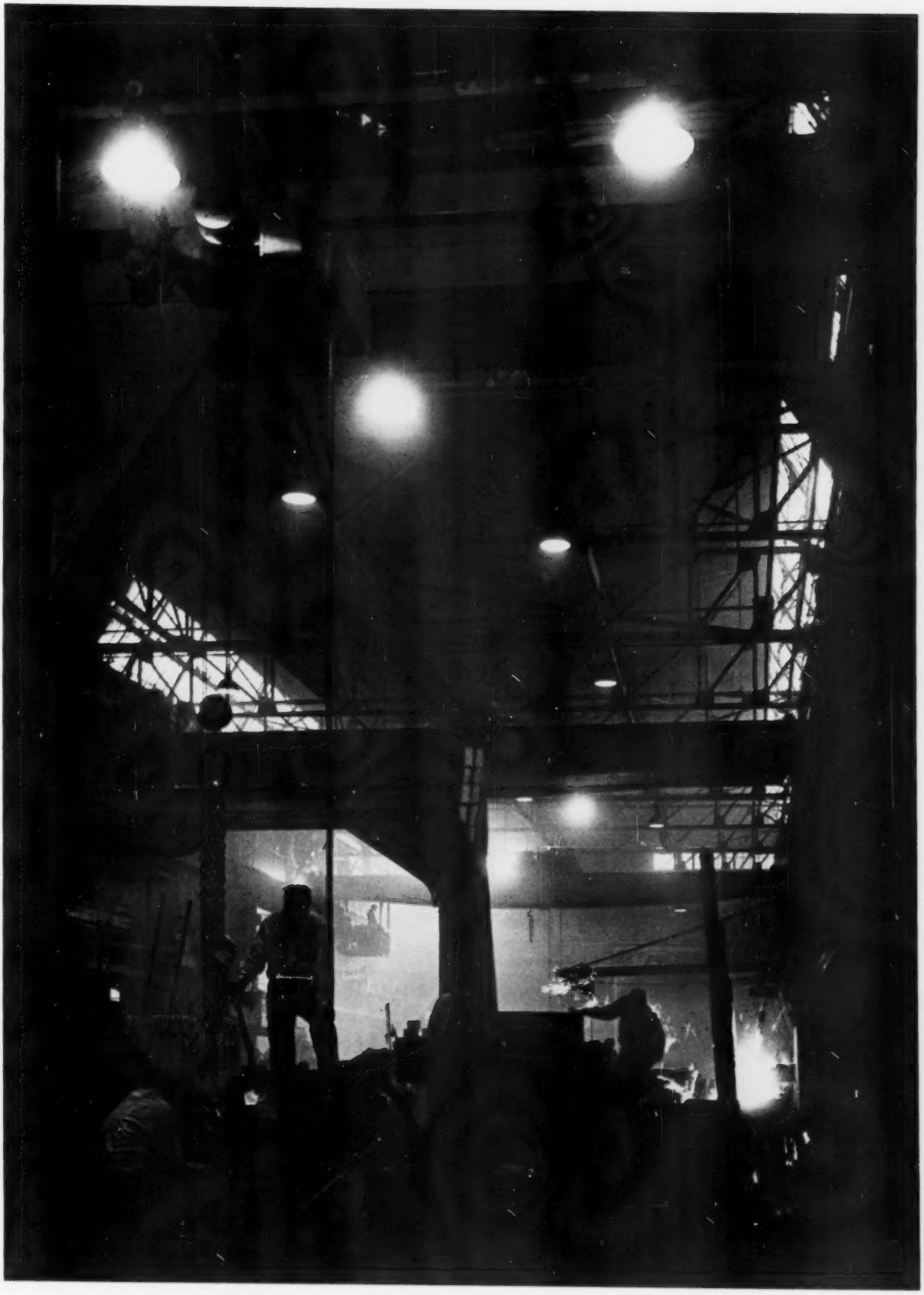

TORKEL KORLING

MAIN BAY . . . *Foundry at Beloit Iron Works, Beloit, Wis.* / *For further details, please turn the page.*

MAIN BAY

In the main foundry bay at Beloit Iron Works, seen in the photograph on the preceding page, the cupola is being tapped into a 15-ton ladle as the day's heat gets under way. Each heat is accompanied by meticulous technological control of sand characteristics and metal analysis. During Beloit's current expansion program this bay will be doubled in size and a separate bay will be built exclusively for casting rolls and dryers. Plans also include the installation of a new core room and expansion of melting, moulding, and sand system equipment.

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the incoming steam to the dryer and exhausted condensate to the jet housing, where a pressure corresponding to its temperature is continuously maintained.

A minimum pressure drop is automatically established at the siphon outlet. It sustains maximum heat transfer by preventing any loss in temperature and pressure head under extreme condensing loads. This arrangement is seen in Fig. 1.

To select a C-B, you need only calculate the unit for maximum condensate load involved at any given operating differential.

PRINCIPLES OF DRAINAGE . . . In a flash system some arbitrarily established low pressure is fixed in a tank to which condensate from the dryers flows. Obviously, excess steam flows through the siphon along with condensate, gases and air, since there is no restriction. Thus, there is a tendency to exceed volumetric capacity of the siphon because of the great difference in volume between liquid and steam. Because of this the continuous liquid flow is constantly interrupted.

Since excess steam must be disposed of, it is returned to the steam feed header of the next machine section, together with gases and air from the first section. Obviously, steam is diluted in temperature by the gases and air, and in quality the steam is "wet."

In some instances, this process is repeated through a third lower pressure section of the wet end of the machine. Disposing of this excess steam must therefore be accomplished by use of heat exchangers or cold injection water to enable proper flow of steam and pumping for disposal of condensate and wasted condensed steam.

The arbitrary pressure drop across the siphon has a tendency to affect temperature and pressure head in the dryer, particularly when heavy condensing occurs during speed increase. Thus, loss of temperature and latent heat transfer to the product occurs just when it should be at maximum.

Compare this with continuous straight-through flow of steam to the dryers and uninterrupted flow of condensate, gases and air to the jet without appreciable pressure drop. The difference between the flash system and C-B jet unit accounts for the higher production at lower steam costs that many mills are now experiencing. In 99% of machines using the C-B system, the condensate is recovered in either feedwater makeup system or the boiler, with only a radiation loss of a few degrees from temperature and pressure used in the dryer.

Distribution Data Guide Offered to Business Firms

The Distribution Data Guide, a publication of U. S. Dept. of Commerce, now is available on a subscription basis to all business firms engaged in or interested in marketing and distribution of goods and services.

This monthly publication contains a selective review of current basic information, statistics, surveys and reports—both government and non-government—of significance to retailers, wholesalers, sales organizations, purchasing agents, transportation and warehousing firms, advertising and market research organizations and many other business operations.

The Guide describes each item of material listed, gives the price and states where copies may be obtained. All items are indexed and cross-referenced in the semi-annual index supplements published with the July and January issues.

Annual subscription to the Distribution Data Guide is $2.00 and may be entered with the Superintendent of Documents, U. S. Government Printing Office, Washington 25, D. C. or at any Dept. of Commerce Field Office.

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For over twenty-five years, Lodding has advanced principally because we recognize the service requirements of our customers. Our philosophy has always been to sell results. This same reasoning applies to our knife business. Our chippers and other knives for the paper industry are sold on a service-result basis, the same way as our doctors have been sold.

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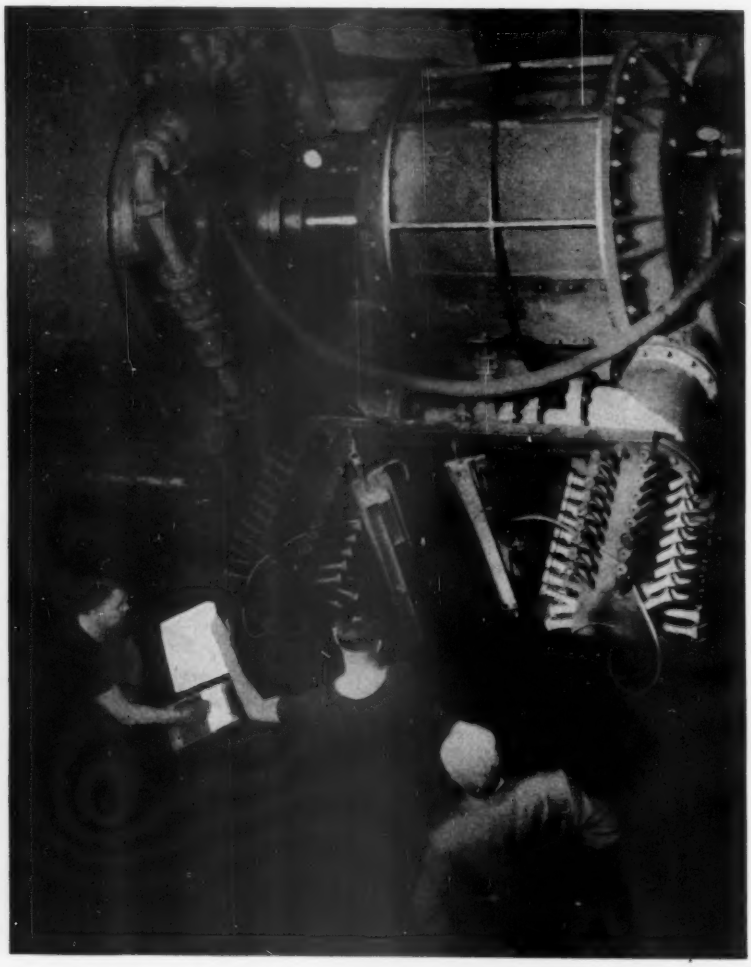
Rated performance of every Nash Vacuum Pump is assured by this precise laboratory test



Rated capacities of Nash Vacuum Pumps are not theoretical. Every Nash Pump is tested individually. Air capacity is determined by delivery thru accurately machined and calibrated orifices. Related vacuum is measured by precise mercury column, and horse power is recorded electro-dynamically. Records of these tests are retained by us, and certified copies are available to Nash Pump owners.

That is one of the reasons why Nash Vacuum Pumps are installed in over a thousand leading Paper Mills. An engineer from Nash will be glad to survey your mill, and make recommendations, entirely without obligation to you.

NASH ENGINEERING COMPANY

440 WILSON ROAD, SO. NORWALK, CONN.

About Those Golfers and Their Lake States Section

SEE FACING PAGE ➤

● The Lake States section of TAPPI is an active, serious group, which thrives healthily, to some degree, because it is "under the shadow" of the Institute of Paper Chemistry, this industry's own graduate school in Appleton, Wis. Students at the Institute find in the TAPPI section an interesting extracurricular activity. The remarkably progressive paper companies in Wisconsin and Minnesota—anyone in this industry can name three or four, at least, which are trailblazers for new or improved processes or manufacturing techniques—also provide a rich "crop" of earnest members for the section.

However, once a year the Lakes States section has its Fun Day, in cahoots with the salesmen who tour the territory. Reports are that over 100 salesmen to this industry live in Appleton itself—more than in any other "Paper City" in the world.

The pictures facing this page, taken by PULP & PAPER, show the Lake States men at play, on the Shalagoco golf course at Shawano, Wis., on the edge of a major northern Wisconsin Indian reservation. About 100 turned out for golf, while an amazing large number—45—were trapshooting at another nearby spot.

Last month, PULP & PAPER reported that one piece of serious business was taken care of at this Lake States Fun Day—Steve Baisch, design engineer in charge of engineering at Thilmany Pulp & Paper Co., was elected the new section chairman.

Don MacLaurin, Gilbert Paper Co., tech. director, was elected vice chairman; Bob Leaf, vice president of development, Shawano Paper Mills, was elected treasurer, and Walter Bublitz, Kimberly-Clark researcher, was elected secretary.

Mr. Leaf was particularly pleased because he was the chief arranger, and with his cohorts at the Shawano mill, showed the bigger paper companies in Wisconsin that a little mill could put on a good meeting, too!

JAMES FARRARA, Stowe-Woodward Sales Engr., has been transferred to Ohio, to cover Ohio, Ill., and Ind. He has had 10 years at S-W's home plant in Newton, Mass., is well versed in manufacture as well as application of Stowe-Woodward rubber covered rolls.

SOMETHING STARTLING ABOUT THAT SCORE? . . . (L to r) CHARLES N. EGAN, Pres., Treas. and Gen. Mgr., Shawano Paper Mills; JACK HOSMER, Corn Products Sales Co., Appleton, Wis., JOHN PURDY, Pres. of Tuttle Press, Appleton, who is pointing; RAY TOTTEN, Ciba Co., Appleton, who thinks it's funny, and MIKE MULLIN, Corn Products Sales, Milwaukee, who agrees.

WATCHING A LONG ONE . . . (L to r) AL KNAPP, Central States Engineering, Inc., consulting engineers, Appleton; WILLIAM A. J. MITCHELL, Pres., Central States Engineering; JOHN STEVENS, Johns-Manville Corp.; WILLIAM KROENKE, Tour Boss, Shawano Paper Mills.

LINEUP TO TEE OFF . . . (L to r) WILLIAM DARR, Hercules Powder Co., Milwaukee; DICK ANDERSON, U. S. Movidyn Corp.; KEN HAY, Asten-Hill Mfg. Co., and O. L. McCORMICK, Technical Director, Shawano Paper Mills.

WHADDAYAMEAN, CONCEDE IT? . . . (L to r) DANIEL P. SHEDD, Monsanto Chemical Co., Appleton; DICK O'BRIEN, Manitowac Shipbuilding Co., who is measuring putt, and CHARLES KLUCKER, Anheuser-Busch Inc., Appleton.

THE "VETERANS" . . . NO STRENUOUS SPORT FOR THEM . . . (L to r) ERIC D. LINDBERG, Pres., Chemical Supply Co., Neenah; DON STARK, Lake States Mgr.-for Black-Clawson Cos., and LEO FITZGERALD, Mgr., Hercules Powder Co., Milwaukee.

DID SOMEONE DUB ONE? . . . (L to r) ANDY ANDERSON, Anderson & Loebel, Milwaukee; S. R. (JIM) PARSONS, Consolidated Water Power & Paper Co., Wis. Rapids; GEORGE WILSON MEAD II, Consolidated Water Power & Paper Co.; JOHN BARRETTE, Consolidated Water Power & Paper Co., Biron, Wis.; and RICHARD ELIAS, Marathon Corp.

A "DEAL" IN CLUBS? . . . (L to r) JAMES GRAHAM, Thilmany Pulp & Paper Co.; BILL NOTBOHM, Valley Iron Works, looking over "Jim's" driver; PAUL GUTTING, Ingersoll-Rand, Rockford, Ill.; and AUBREY PHILLIPS, Allis-Chalmers Mfg. Co., Milwaukee.

ALL HAPPY OVER A BIRDIE . . . (L to r) ROBERT WILLIAMS, Institute of Paper Chemistry; WILLIAM LANG, Nekoosa (Wis.) Foundry Co.; DAVID MOST, Institute, and DAVID KNOX, Industrial Nucleonics, whose "birdie" it was.

NEW PREXY IN A RELAXED MOOD. Here's MARTIN (MARTY) J. AUCHTER, (left), the new National President of the Supts. Assn., taking it easy—picture by PULP & PAPER. His wife, Em, daughter, Helen, and son, Jim, went to Lake Placid to see him elected. The "inside dope" is that he won his political "battle" hands down! Here he is with two Wisconsin associates—JOHN M. HAYES (middle), President of Appleton Mfg. Co., Appleton, Wis., and ROBERT E. KISSEL (right), Gen. Supt. at Charmin Paper Mills, Green Bay, Wis. Mr. Kissel is "right hand man" to Mr. Auchter at Charmin, where the latter is Vice Pres. of Mfg. and they have adjoining offices.

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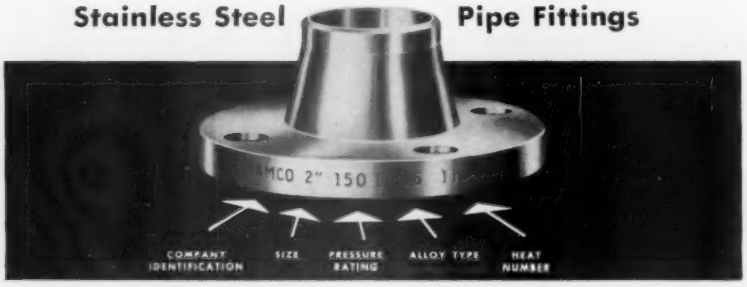
Stainless Steel Pipe Fittings



QUALITY . . . All CAMCO fittings are permanently marked with the CAMCO trade name as evidence of complying to the high standards of CAMCO quality.

SERVICE . . . We are able to expedite delivery because our products are sold and stocked by distributors throughout the country and backed by large stocks at the plant for requirements in excess of normal.

VALUE . . . All our facilities are geared to the manufacture of STAINLESS STEEL FITTINGS only . . . the economies resulting from this specialization are passed on to you, providing DROP FORGED fittings, where possible, for no more than the cost of cast fittings.

One source for all your Stainless Steel Fitting Requirements

SCREWED • FLANGED • WELDING

FREE! STAINLESS STEEL PIPE FITTINGS

Use attached coupon for Flange Dimensional Slide Rule and Catalog covering complete line.

CAMCO Products, Inc. 445 State Street North Haven, Conn. PF

☐ Please send Flange Dimensional Slide Rule.
☐ Catalog No. 653 covering complete line.
☐ Furnish address of area distributor.

Name .....
Company .....
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City ..... State .....

THE Quality LINE IN STAINLESS

CAMCO PRODUCTS, INC.

445 STATE STREET NORTH HAVEN, CONN.

Marty Auchter Won Supts. Election Easy!

Milwaukee-born Martin (Marty) J. Auchter is the new president of the American Pulp and Paper Mill Superintendents Association.

This dark-haired, swarthy Wisconsinite is an engineer and operator who believes in "sticking to his lathe." Next year will bring his 20th anniversary at Charmin Paper Mills, Green Bay, Wis., which was the Hoberg Mills when he first went there. For ten years he has been vice president of manufacturing, and in that time he has had charge of considerable expansion, planning and installation and startup of new equipment. This has included the installation of Chamin's No. 1 Fourdrinier Yankee, construction of a sulfite by-product torula yeast plant and many other innovations and modernizations.

He is a 1932 graduate in engineering of Marquette University. For the first five years out of college he worked in the engineering drafting shop of Allis-Chalmers Mfg. Co. Then he moved north to join the staff of President Joe Conway at Hoberg, now Charmin, the only other employer he has ever had.

Marty Auchter took his wife, "Em," his daughter Helen, 16, and son, Jim, 13, by car to the Lake Placid, N. Y., meeting of the Superintendents so they could be on hand when he was voted into the presidency.

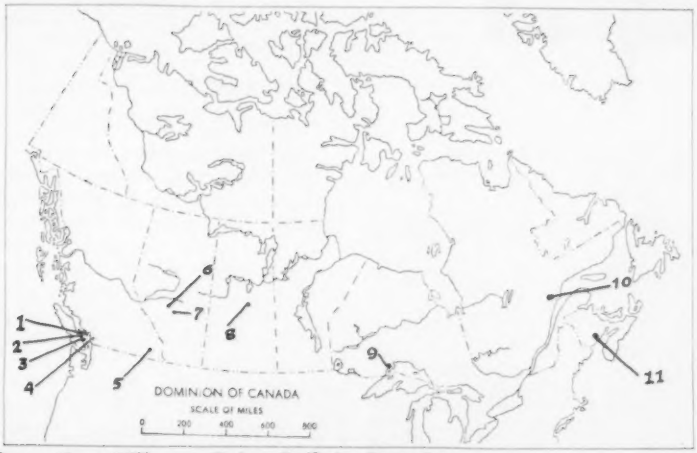
Mr. Auchter becomes the 33rd president. Outgoing president at the National Convention at Lake Placid was Howard Street, Nationalized Vulcanized Fibre Co. plant manager. Now in line for president next year is Al E. Bachmann, president of Missisquoi Corp., Sheldon Springs, Vt., who already has been national president of TAPPI. Then comes Howard Wehr, Mead's Harriman, Tenn. mill manager, and Tom Coldewey, St. Joe Paper Co. production veep, who are now 3rd and 4th vice presidents of the Supers.

Milton M. Bixby, director of PMC sales, Hercules Powder Co., takes over as the new chairman of the Supts. Assn. affiliates, with John D. (Jack) Dickson, Jr., Lake States rep. for Stowe-Woodward, as first vice—in line for the job in '57.

MILTON M. BIXBY, new Chairman of the Supts. Assn. Affiliates. He is Sales Director for the Paper Makers Chemicals Dept. of Hercules Powder Co.

PULP & PAPER

NEWS FROM CANADA



Where New Mills are Being Built in Canada

(1) Elk Falls Co. (Crown Z), Duncan Bay, B.C. (2) MacMillan & Bloedel, Port Alberni, B.C. (3) B. C. Forest Products, Crofton, B.C. (4) Sidney Roofing & Paper Co., Vancouver, B.C. (5) Celgar Ltd., Castlegar, B.C. (6) Antler Wood Products, White Court, Alta. (7) North Western Pulp & Power Co. (St. Regis), Hinton, Alta. (8) Waskesiu Forest Products, Prince Albert, Sask. (9) Great Lakes Paper Co., Fort William, Ont. (10) Thurso Pulp & Paper Co., Thurso, Que. (11) Robert McAlpine-Butler Co., Lepreau, N.B.

NOODLE PULP SHIP LAUNCHED . . . The big new pulp carrier which will carry noodle pulp from the Duncan Bay pulp mill of Crown Zellerbach Canada in British Columbia, to Antioch, Calif., was launched in May at Kure, Japan, and will soon be turned over to National Bulk Carriers, Inc., for operation.

Capt. Herbert Raby of Vancouver, B.C., who will be master of the ship, attended the launching. The ship is 567 ft. long with a beam of 84 ft.

Bearing the name Duncan Bay and flying the Liberian flag, the carrier will be operated by Universe Tank Ships, Inc., one of the many companies controlled by D. K. Ludwig, head of National Bulk Carriers.

Captain Raby says that a remarkable feature of Japanese shipbuilding is the speed with which ships are being produced.

Keel of Duncan Bay was laid Jan. 10 and she was launched four months later. It might have taken as many years to complete the job in the United Kingdom.

The Kure shipyard where she was built has been under lease to Mr. Ludwig for several years. It was formerly a Japanese navy yard.

WHERE WILL BOWATERS BUILD IN CANADA? . . . Several sites are being studied for Bowaters new 100,000 tons groundwood mill in Canada.

Corner Brook, Nfd.—Some doubts expressed as present mill there is so big now.

Quebec—Believed ruled out by Premier Duplessis' unfavorable attitude toward this industry.

British Columbia—Frequently mentioned. But no recent inquiries from Bowaters for forest license.

A NEW MARKET PULP MILL . . . A new Saskatchewan pulp mill to be known as Waskesiu Forest Products, is to be near Prince Albert, estimated to cost between $50,000,000 and $60,000,000.

Robert Campbell, Vancouver, B. C., construction man, and a syndicate are behind the deal, which has the enthusiastic support of the Saskatchewan government. Charles Schultz, head of C. D. Schultz & Co., forestry consultants of Vancouver, has been doing preliminary work on the project.

It will be a market pulp producer—bleached and unbleached sulfate. There's some financing to be done yet, so they may not get started with construction until the Fall.

WILL OPEN ENOUGH TIMBER FOR TEN MILLS—Extension of pacific Great Eastern Railway north of Prince George and into the Peace River country, now under way, will render a whole new timber empire accessible, according to Einar Gunderson, executive vice president of the government-owned line and advisor to

Greater Production of Higher Quality Pulp

- *in Less Time*
- *at Lower Cost*

This is the end result of the various processes and equipment which we have installed in pulp mills throughout North America. Send us details of your requirements.

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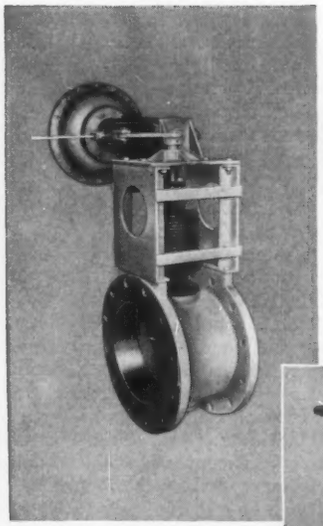
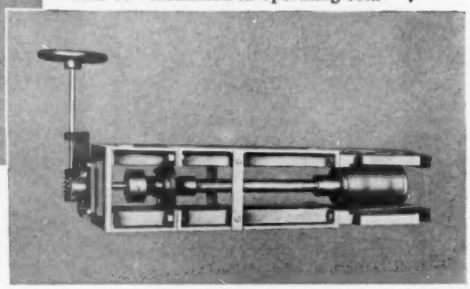


R-S
BUTTERFLY VALVES

All-bronze, 150-pound R-S Valve for operation at—300° F. Valve is installed with 18" insulation in operating cell. ▼



Special 12-inch R-S Butterfly ▲ Valve, with finned lubricated stuffing box, is used for service with hot gases at 1,000° F.

SPECIAL R-S VALVES SOLVE TEMPERATURE, CORROSION, ABRASION PROBLEMS

To meet rugged processing conditions, R-S Butterfly Valves can be built to your requirements. For valve bodies and parts, any metal or other material that can be cast or welded — even plastics — may be specified.

There are a number of materials available to meet extreme working conditions involving corrosion, abrasion, erosion, high heat and pressure. In addition, the **R-S** Rubber-lined Valve may be specified to resist certain types of corrosion. Every R-S Valve gives you quick and positive closure with any type of controls, uniform control in normal regulating ranges and minimum pressure drop.

If your past experience offers no precedent, you can call on our background in specialized valve engineering to solve material problems.

We have built valves to operate in a temperature range of from —300° F to +2,000° F. For complete information on our complete line of butterfly, ball and cone valves, see our local representative or write S. Morgan Smith Company, York, Pennsylvania.

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ROTOVALVES · FREE-DISCHARGE VALVES · BALL VALVES · CONTROLLABLE-PITCH SHIP PROPELLERS · BUTTERFLY VALVES

S. MORGAN SMITH

AFFILIATE: S. MORGAN SMITH, CANADA, LIMITED • TORONTO

Premier W. A. C. Bennett.

Mr. Gunderson estimated that there would be enough pulpwood in the territory served by the expanded P.G.E. to provide for more than 10 new pulp mills. He made this estimate while addressing the annual meeting of the Canadian Forestry Association in Vancouver, B.C.

Equipment Prices Compared in West U. S. and Canada

Tariffs to protect Canada's secondary industry are tending to increase the costs of mills, H. R. MacMillan, retired chairman of MacMillan & Bloedel, says. Comparing cost of equipment in British Columbia and the Pacific Northwest states, he says cost of a digester in B.C. is $45,000, compared with $36,000 in the U.S. Other costs, with U.S. prices in parentheses: Blow tank, $58,000 ($43,500); recovery boiler, $928,000 ($760,000); evaporator, $267,000 ($191,000); pulp washer, $170,000 ($126,000); chipper, $105,000 ($78-000); boilers, $255,000 ($210,000); structural steel, about 15% higher.

NEW SET-UP AT SIDNEY ROOFING includes R. W. MAYHEW (left), founder and long-time President, now Vice Chairman of the Board; T. N. FINICAL (middle), Vice Pres., Mfg.; H. E. BROWN (right), Secy-Treas. and Director.

Changes at Sidney Roofing

After 40 years of operation on Vancouver Island, principally at Victoria, B.C., Sidney Roofing & Paper Co. will gradually move facilities to Vancouver, B.C., on the mainland, where a new $4,000,000 plant is being built.

Personnel as well as plant changes are now being made. R. W. Mayhew becomes vice chairman of the board; he is a founder of the company and long-time president. J. A. Craig, former vice president and general manager, has been appointed president and managing director. T. N. Finical is vice president, in charge of manufacturing.

Other new titles are: Harold Mears, vice president, sales; David Spence, vice president and managing director of National Paper Box Ltd. and Vancouver Paper Co. subsidiaries; H. E. Brown, secretary-treasurer and director.

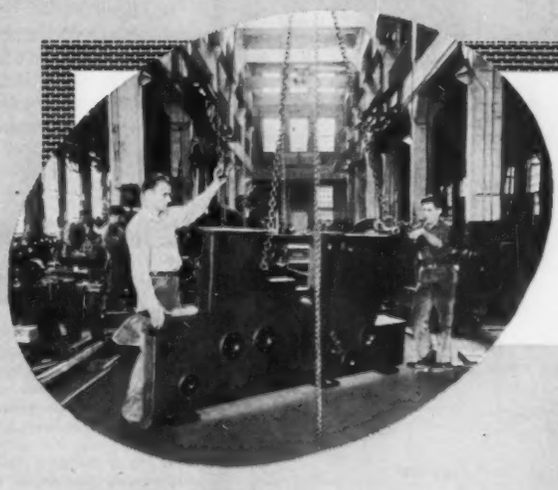
EQUIPMENT AND SUPPLY NEWS

HEAD UP CRANE SALES . . . Crane Co. today announced executive appointments in two of its major sales divisions: J. W. Greene was named director of industrial sales, and W. A. Burbine became director of heating sales.

Both were promoted from district managers. Mr. Greene headed sales in the east, headquarters at Long Island City, N. Y. He joined Crane in Houston in 1936. Mr. Burbine was in charge of sales operations in the Midwest, headquarters Chicago. He joined Crane in Boston in 1930.

HOW TO INSTALL CABLE CONVEYOR . . . Tipp Mfg. Co. offers all the information needed to order and install a Tipp cable conveyor system, including an unusual diagrammatic plan for layout and dimensional calculations in its new engineering manual. There is also a separate section on the Tipp-Tronic, a new automatic safety controller that provides warning and prevents damage from abnormal load conditions of any kind on electrically driven conveyor system. Write to Tipp at Tipp City, Ohio.

"From ingot to fourdrinier wire"



HAIRSPRING ACCURACY — BRIDGE-BEAM SIZE

Our machine shop doesn't make hairsprings or bridge beams, but our maintenance and construction operations demand equal versatility from our men and machines. Hub of an integrated operation such as ours, its skilled personnel are ready to machine a part to a fraction of a thousandth of an inch, on a tiny instrument part or a huge loom frame.

Because our plant is *completely integrated*, every wire we ship has undergone thorough and continual analysis, control and testing from the raw metals to your finished fourdrinier wire ready for quality paper production.

We are proud to say they are *truly ours* — "from ingot to fourdrinier wire."

EASTWOOD-NEALLEY CORPORATION
Belleville, N. J.

Old Friend on New Lift Truck

JACK WILCOX, Manager, Process Equipment Div., Electric Steel Foundry Co., Portland, Ore., has been seen in most of the chemical pulp mills of North America over many years, but this is the first time most of his friends have seen him piloting a lift truck. It is the new Hyster HYT model. He climbed aboard machine being tried out in warehouse of Esco Ltd., Toronto, Ont.

DESCRIBES ROLL GRINDERS, GEARS, ETC. . . . Farrel-Birmingham describes its facilities and products in a new booklet, "This is Farrel-Birmingham," available by writing to the company, Ansonia, Conn. One excerpt: F-B is the largest producer in the U.S. of rubber and plastics processing machinery, as well as a leading manufacturer of chilled iron and alloy iron rolls, roll grinders, gears and heavy machinery for paper and other industries.

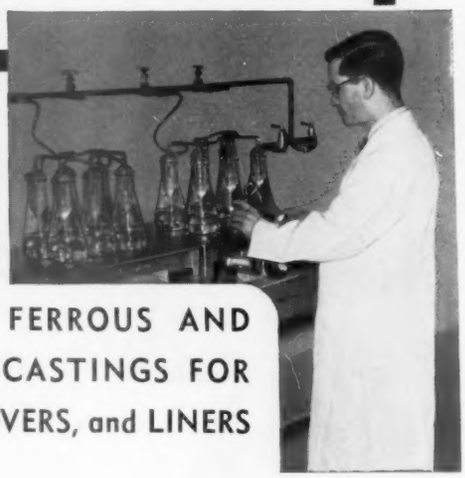
SUPPLIES & EQUIPMENT

HOW TO SELECT CLAYS . . . Minerals & Chemicals Corp. of America offers to help you select the Edgar Paper Clay most suited to your requirements by sending a copy of "Basic Properties of Edgar Paper Clays." Just write to M&C at 5 Station Place, Metuchen, N. J.

A QUIZ TEST . . . Callaway Associates of Boston have issued a new pocket edition of "Practical Paper Technology" with a new supplement, "A Quiz Test on Paper."

EARL PAINT CORP. is marketing Erco-Crete, a unique and easily applied material for patching and resurfacing concrete and similar surfaces. This material is used for interior and exterior exposures and has exceptional adhesion, strength and durability. Erco-Crete is said to be completely resistant to all straight chain hydro-carbons, such as gasoline, grease and oils. Its adhesion to concrete is reportedly stronger than concrete to itself. For further information ask Earl Paint Corp., Utica, N.Y.

To Rely on SANDUSKY Is to Rely on Research



CHIEF SANDUSKY

CENTRIFUGAL FERROUS AND NON-FERROUS CASTINGS FOR ROLL SHELLS, COVERS, and LINERS

There's a great deal more to a centrifugal casting than the finished product itself. It starts in the early stages of development and planning when Chief Sandusky technicians, through research and test experience, are able to specify valuable procedures that will save production expense and man-hours in your operation.

Add to this research the right materials and consistent control and the result is a ferrous or non-ferrous casting which will do its specific job while resisting heat, abrasion, and corrosion as required. An additional service is machining facilities for turning, boring, and drilling.

Rely on Chief Sandusky as an organization of specialists with the answers to your problems with the finest of centrifugal castings.

Chief SANDUSKY CENTRIFUGAL CASTINGS

FERROUS AND NON-FERROUS

SANDUSKY FOUNDRY AND MACHINE CO., Sandusky, Ohio

CONTROL FOR DEMINERALIZERS, SOFTENERS, ETC. . . . Cochrane Corp. publication 5813 describes the hydromatic valve used in the control of demineralizers, zeolite softeners, dealkalizers and pressure filters. Included are design features, operation and advantages of the hydromatic valve which can be operated automatically or manually. Write to Cochrane at 17th St. below Allegheny, Philadelphia 32, Pa.

INTRODUCES CHLORINATOR . . . Wallace & Tiernan is introducing the first models of the V-notch line of chlorinators, built entirely with corrosion resistant materials and featuring a new metering and controlling principle—the V-notch variable-orifice. Technical bulletins on these are yours by writing Wallace & Tiernan at Belleville, N. J.

WATERPROOF BELT CEMENT . . . J. E. Rhoads & Sons is now making a new waterproof leather belt cement that is said to reduce drying time 50%, JE538. Other qualities: Stronger than waterproof cements; sticks when leather is slightly moist or oily; will withstand constant flexing over pulleys; waterproof and oil resistant and belt laps are not weakened under normal conditions.

PAPER MEN

$5,000 to $100,000

PRODUCTION—SALES—MANAGEMENT

We have immediate openings for qualified men in all phases of the paper industry. If you have experience; are looking for bigger responsibilities or a general management assignment, we can assist you. No retainer or placement fee to be paid unless you accept employment through us. For confidential service call, wire or write.

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A paperboard manufacturer has openings for two sales representatives in Southern and Southeastern areas. Please reply to Box 275, PULP & PAPER, 370 Lexington Ave., New York 17, N.Y.

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TEHUANTEPEC—500 square miles, timber, hardwood, pulp operation, mineral deposits, rivers, railway, highway, ports.

MEXICO CITY—Magnificent residence, Jardines Pedregal Section.

THIRTY MINUTES FROM CAPITAL—Beautiful hacienda, all conveniences. Write: T. C. Pridmore Brown, Worth Realty, Pasco de la Reforma No. 1—862/863, Mexico 1, D.F. Mexico.

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We will welcome an opportunity to be of service, if you are available for a position in paper or pulp manufacturing or paper converting. SEND US YOUR RESUME. Many attractive positions at excellent salaries are open for top-notch men. No fee to be paid unless you accept employment through us. Negotiations are confidential.

Charles P. Raymond Service, Inc.
Phone: LIberty 2-6547
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PULP MILL SUPERINTENDENT

Wanted for 800 ton Kraft Pulp Mill in paperboard plant. Must be competent and experienced. Salary open. This position is with a large company and is a real opportunity for a capable person. Write to Box 274, PULP & PAPER, 370 Lexington Ave., New York 17, N. Y.

MECHANICAL ENGINEER WITH SULPHITE AND PAPER MILL EXPERIENCE

Real opportunity open with established consulting engineers. Salaried position with paid vacation, holidays and sick leave. Excellent opportunity for advancement and for interesting work with expanding firm in pulp and paper mills, power plants, chemical processes, and general engineering for industry.

John G. Hoad and Associates
8 East Michigan Avenue
Ypsilanti, Michigan

PUGET SOUND FABRICATORS, INC., Seattle, Wash., tells about their expanded custom fabricating facilities and services offered by their 70,000 sq. ft. plant in a new brochure. Included is information on techniques of non-destructive testing of tank and vessel welds through use of X-Ray and gamma ray examination. Additional data accents custom fabrication for pulp and paper field. Write to Puget at 3670 East Marginal Way, Seattle 4, Wash. Ask for bulletin No. K-4.

If you have a Quality Control Conscience and a Moisture Control Problem

THEN it's time to investigate SENTRY®—the first high speed, continuous moisture detector to utilize the dielectric property of paper in an entirely new electronic circuit—a circuit which produces a signal of greatly increased stability regardless of grade of paper. Used singly or in conjunction with an integrated control system, SENTRY provides the "missing link" in your quality control program. Full width scanning, of course. Write TODAY for literature. Laucks Laboratories, Inc., 1201 Poplar Place, Seattle 44, Washington. SENTRYS *for Pulp, Paper, Softboard, Plywood, Lumber, Veneer.*

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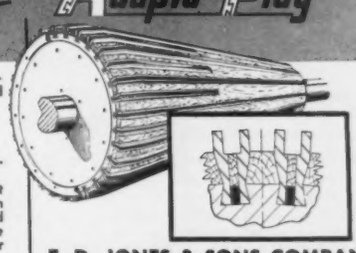

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You can't beat HAMILTON Felts for uniform squeeze!

Woven endless or seamless, the uniform thickness, texture and finish of Hamilton Felts transmit the full force of the presses to every square inch of the sheet . . . and leave a feltmark.

That's *one* of the reasons why master papermakers, since 1858, have preferred Hamilton Felts for the manufacture of papers and boards of every type.

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MIAMI WOOLEN MILLS
Established 1858

WANT A NEW STETSON? • *Suggest A New "Headpiece" for Ham Feltz*

HAM FELTZ SAYS:

"Send me your idea (a very rough sketch will do) — of the type of headpiece the best wet-end operators will wear this summer. If I wear it in future ads I'll send you a new hat (your size, of course)."

SHULER & BENNINGHOFEN, HAMILTON, OHIO

AUTOMATION ...on stock supply!

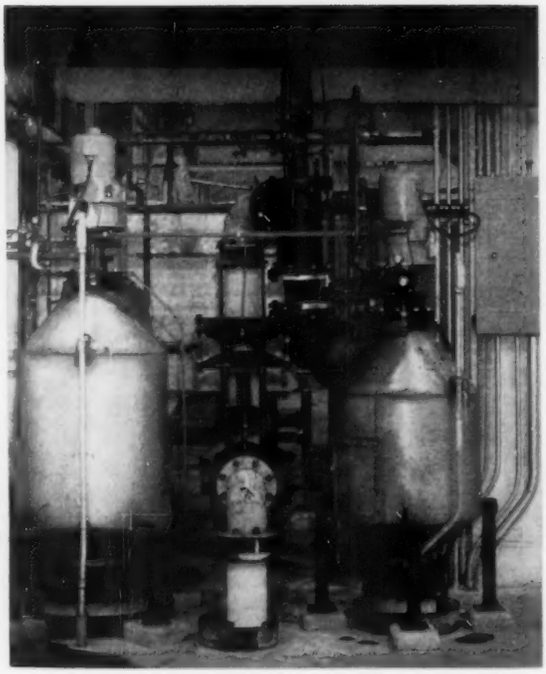
DeZURIK AUTOMATIC RECORDING CONSISTENCY REGULATORS

ACCURATE DeZurik Automatic Stock Consistency Regulators deliver a complete 24-hour recording of both incoming and outgoing stock consistencies. They are guaranteed to hold consistency within limits of plus or minus .1%. (Many DeZurik Regulators directly ahead of paper machines are holding consistency within plus or minus .02%!)

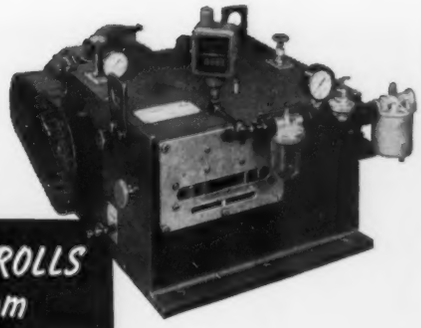
SIMPLE Adjustment is easy — a single knob sets the regulated consistency. Operation is unaffected by spattering stock, and response is instantaneous to changes in incoming consistency.

ADAPTABLE A wide range of box designs in three basic types: Pipe Line type, used on systems under pressure; Pan type takes gravity flow from washers, deckers, savealls, etc.; Stuff Box type, installed ahead of paper or board machines, or ahead of a finishing refiner.

Write for complete details, including information on the DeZurik Closed Stock System, a low cost, package unit that permits higher machine operating speeds, guarantees more uniform basis weight and gives improved sheet formation.



DeZURIK SHOWER COMPANY
Sartell, Minnesota



KEEP ROLLS from WRINKLING

Install a Ross Midwest Fulton Hydroscillator on your rewinder and keep wrinkles out of your rolls—also hard and soft spots. And what better way to eliminate customer complaints!

Although comparatively new, a score or more mills have already installed Hydroscillators and pronounced them "good"—a really worthwhile help at the rewinder.

Ross Midwest Hydroscillators are hydraulically operated—can be set to deliver strokes of from ½" to 3¾" as required. Oscillating speed from 0" to 24" per minute. Thrust up to 11,000 lbs. Effective on rolls of all sizes—even the very largest. Space required—very little.

Ask for Bulletin No. 101

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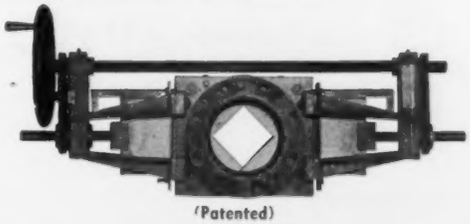

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A new idea in stock flow control, for critical applications. Non-plugging, even with openings less than 1". Available in all materials. Hand-wheel, or motor-operated for remote control.

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★ Speedline Paper Mill installation!

From Maine to Florida . . . Massachusetts to Washington . . . plant engineers for leading pulp and paper mills have discovered the new standard in pipeline economy possible only with light-wall stainless steel pipe and SPEEDLINE corrosion-resistant fittings. And here's why—

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Schedule 5 or 10 pipe with SPEEDLINE Fittings provides safe, effective pipe wall for as little as half the cost of schedule 40 pipe and conventional screwed fittings!

Speedline

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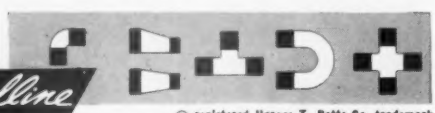

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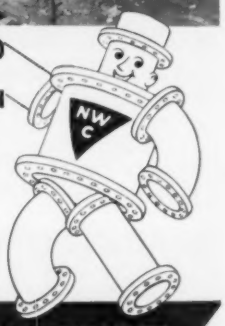

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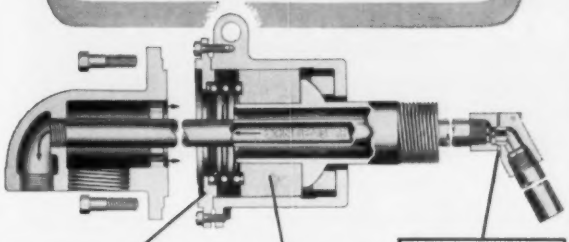

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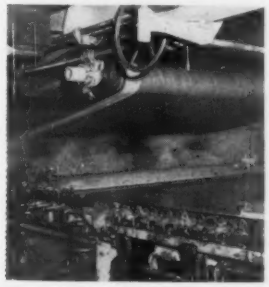

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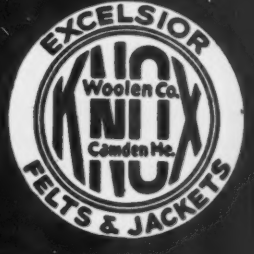

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The LAST WORD PULP & PAPER EDITORS' PAGE

"Inside Story" about Some Pictures

In an effort to bring its readers the best possible pictures —both informative and dramatic—PULP & PAPER's editors frequently find themselves pulling photographic gymnastics or climbing to high places and then taking a deep breath before they work up nerve enough to come down.

In this month's Bowaters story, Southern Editor Bill Diehl, of Atlanta, climbed up on top of the steel "crossword puzzle"—Bowaters' gantry crane in the log pond—in order to get the exciting shot of the big gantry dumping its load of logs into the hopper.

He shot 14 pictures in all and luckily so—only two turned out. The rest were ruined because the hopper was vibrating so hard as the ton or so of logs dropped in.

Bill Diehl Gets His Picture

In order to shoot the picture of logs roaring out the end of the flume deep inside Bowaters' mill, he dropped his camera down into the flume chute on a string and triggered the picture with a cable release.

Later, in order to shoot a picture outside, he had to crawl under a freight train and shoot from on the tracks.

In all, more than 100 pictures were taken. Some 40 were printed before the final choice of 14 pictures were selected. On the same assignment, Mr. Diehl climbed to the top of an 80-ft. water tower near midnight to snap a wide-angle shot of the Bowaters' mill at night. You will be seeing this shot in the near future on another article about Bowaters.

Don't get the idea that these feats are required of our editors, or so very frequent, but they do help keep their waistlines down. And when they do happen, we thought you might occasionally like to know about it.

What About Your Ultimate Salesman?

We have been thinking about the fact that manufacturers of woodpulp in North America exert practically no influence whatever, one way or another, on the sale of their product as it finally reaches the consumer market.

And the newsprint manufacturer—does he ever wonder about the final retail dealer of that product? The newsboy.

What about other paper and board manufacturers? Many of them, in their day-in, day-out work, have little time to consider the ultimate salesman of their products. He might be a grocery store clerk, a door-to-door salesman, stationery store saleslady, corner bookshop owner, etc.

We will never forget the morning in a little paper mill town when we had the pleasure of breakfasting with T. B. McCabe, president of Scott Paper Co., and the local Scott mill manager. We sat at a table near a window. While ordering breakfast, Mr. McCabe glanced across the street. A grocery store was just opening its doors. He was across the street and back again, before his breakfast was served. He just wanted to see how tissues and household papers were being displayed by the storekeeper.

Not long ago we heard J. S. Sayre, who came back from retirement to resume the presidency of Norge Division, Borg-Warner Corp., discuss "A Marketing Program to Meet the Challenge of Our Expanding Economy."

Mr. Sayre said all business productivity is dependent upon consumer marketing. And then he went on to destroy the myth that we are going to have any such thing as automatized distribution. He said: "Automation—it's an ogre to labor unions; a choice morsel to politicians. But you will never automate merchandising."

He said there is no substitute for the dealer or the person who in the final analysis gets to the consumer, personally.

"Everyone agrees that the great challenge in our expanding economy is the challenge of distribution. The key to our distribution is the retail dealer and his salesman. In my opinion, the real challenge to all of us is to find better methods and techniques to strengthen this dealer, individually and collectively."

The extreme remoteness of the pulp industry and certainly some major divisions of the paper industry from their final salesman is rather unusual.

The population of the United States reached 167,181,000 on March 1, up nearly 11% in 6 years. It keeps increasing. Distribution gets to be a more acute problem every day. Rising costs of distribution call loudly for attention.

Wouldn't it be worthwhile for this industry to give some thought to the folks at the end of the line—who finally sell its products? To finding better selling techniques and methods for them? To build them up as salesmen?

People Who "Know" the Wrong Answers

Just as people once "knew" the earth was flat, many people today "know" the wrong answers to economic questions, and the results could be disastrous.

With American business spending large sums of money to inform the public, there is no reason today for people to have erroneous beliefs on basic economic matters, it is pointed out by "Service," published monthly by National Association of Manufacturers for industrial editors.

"Back in the 1800's, little attempt was made to explain business and economics to the public," the magazine observes. "It didn't seem so important then. Things are different now. We are a highly industrialized nation. The biggest threat to freedom—Communism—originated as an economic theory. Our whole future may depend upon the public's correct understanding of economic issues—of free individual action vs. socialism."

PULP & PAPER readers undoubtedly know people who believe government has endless resources which could provide security and numerous other benefits. Or others have completely wrong notions about business profits. Many have the false idea that prices can be lowered and wages increased by legislation, without hurting production and causing scarcity.

"Mistaken beliefs can be as dangerous to our economic system as erroneous 'knowledge' of disease has been to our health and lives," says "Service" and how right it is!

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